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"A Global City in a Global Pandemic: Assessing the Ongoing Impact of COVID Induced Trends on London's Economic Sectors"

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"A Global City in a Global Pandemic: Assessing the Ongoing Impact of COVID Induced Trends on London's Economic Sectors"

Dylan Anderson¹, Rachel Hesketh², Mark Kleinman³ and Jonathan Portes⁴

Abstract

Over the last 50 years, London has successfully adapted to technological change and globalization, making it the major driver of the UK economy. But its strengths have also made the city particularly vulnerable to the health impacts of COVID-19, and potentially also to wider negative economic implications of the crisis. Many of London's key sectors rely on proximity, agglomeration economies and externalities. We evaluate the available data on the impact of the pandemic on London to date, with a particular focus on the differential effects between sectors. We also identify seven key trends, affecting both the demand and supply side of the economy, that are likely to have significant medium- to long-term economic impacts, and assess the potential impacts on London's major industrial sectors. Our findings suggest that COVID-19 may further accentuate the existing divide between globally competitive advanced producer services and more locally focused sectors providing lower-value personal and household services, posing a number of significant policy challenges.

Keywords: COVID-19, London, agglomeration economies, migration, services

JEL Codes: J11 , J24, J61, R11

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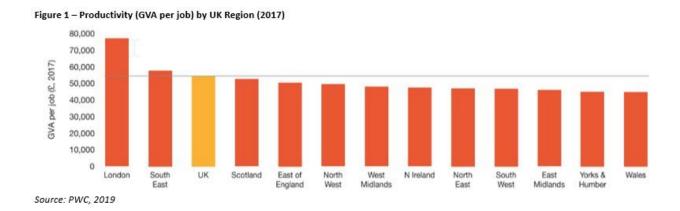
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1. London's Economy and the UK

Over the past 20 years, London's population has grown by around a fifth (ONS, 2020d), while productivity per worker is 40% higher than the UK average (PWC, 2019). The combination of rapid population growth and higher productivity has made London the primary driver of the UK's overall economic growth. London represents almost a quarter of Gross Value Added (GVA) in the United Kingdom while only having 13% of the nation's population (ONS, 2020d) and 17% of its workforce (PWC, 2019).



Over the last half-century, London's economy has successfully evolved from primarily manufacturing and goods-handling to take on a global city role, defined by its diverse economic base including key competitive sectors such as financial and professional services, creative and cultural industries, technology and life sciences (Figure 2) (Girardi & Marsden, 2017). London's connectivity, world-class higher education institutions, innovative companies and an environment of economic, social and cultural openness have attracted people, investment and ideas. London is not unique in these respects: other global cities have followed a similar trajectory, but a combination of history, location and openness have given London, along with New York, a key role in the late 20th and early 21st century global economy. This is reflected in their categorization as the only two 'alpha ++' cities in the GaWC city classification, based on business service links between world cities (GaWC, 2018).

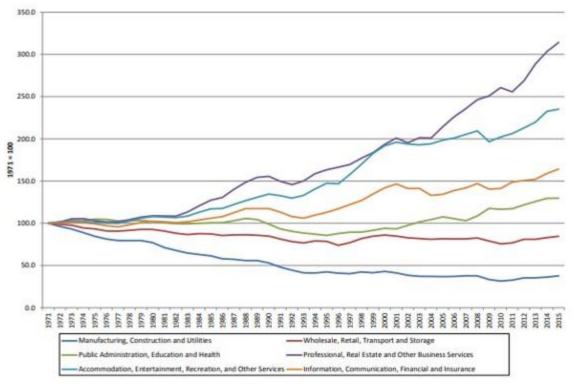


Figure 2 – Workforce Job Growth by Industry in London (1971-2015)

Source: Girardi & Marsden, 2017

Unsurprisingly, London's growing economic dominance has had implications for the political economy of the UK as a whole. London is crucial to the wider UK economy, through supply chains and gateway functions, as well as the fiscal contribution of successful London firms and high-skilled London workers (Girardi & Marsden, 2017); but this creates political tensions. From the perspective of the other nations and regions within the UK, London is often seen as politically and culturally dominant; as draining talent from elsewhere; and receiving a disproportionate share of both public and private investment. These regional disparities were already increasing prior to the COVID-19 crisis, especially economically. For example, while some commentators expected London to be hit hardest by the Global Financial Crisis, given its status as an international centre for financial services, London in fact grew faster than other regions in its aftermath. This resulted in economic growth that was more than double seven of eleven other UK regions between 2010-2016, and 7 per cent higher than the next highest region (Figure 3) (Harari, 2018).

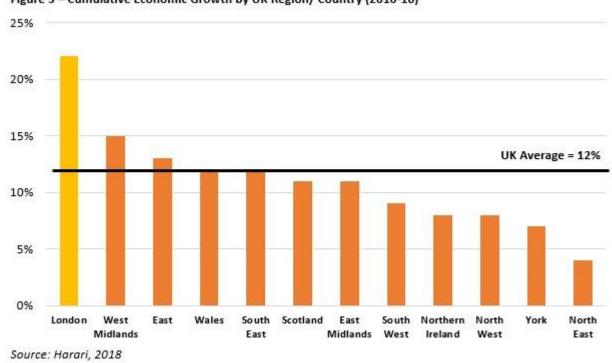


Figure 3 – Cumulative Economic Growth by UK Region/ Country (2010-16)

Politically, these regional tensions are expressed through arguments about the distribution of infrastructure and other spending; the methodology used by Government to appraise transport and other major infrastructure projects; the EU Referendum vote; and the focus on the so-called 'Red Wall' in the 2019 General Election. The conspicuous focus of manifestos on towns rather than cities in 2019 (Kleinman, 2019), and the commitment of the current and previous governments to notions such as 'levelling up', 'rebalancing the economy' or 'reducing regional

disparities', also reflect these long-standing disparities.

But London's undoubted economic dynamism does not necessarily translate to income and wealth at an individual level. London's high wage, high productivity service industries are complemented by lower-wage service sectors such as food services, personal services and retail. Therefore, while a significant group is much better off than the UK average, the large population of low wage workers, who also face high housing and living costs, results in high levels of poverty and deprivation throughout the city. For example, as of 2018 London had ten

boroughs with child poverty rates in excess of 35% and one in five London employees were paid below the 2016/17 London Living Wage of £9.75 (Child Poverty Action Group, 2020).

2. COVID-19's Immediate Impact on London

2.1 COVID's Health Implications

It is against this background that the COVID-19 pandemic hit the UK in March 2020. In public health terms, there are a priori reasons why one might expect London's case and death rate to be high (e.g. international connectivity, public transit usage, density, poverty) as well as offsetting factors, such as a younger age structure compared with the rest of the UK. In this paper, we do not explore these relationships in detail, but we do know that in the first three months of the pandemic, London saw the highest number of COVID-19 deaths in the UK (ONS, 2020c) (Figure 4). This fact showcases the serious health implications the pandemic had on the city.

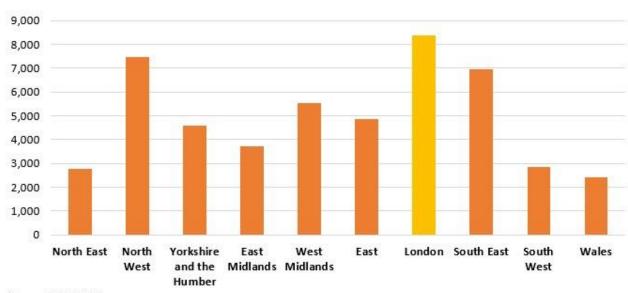


Figure 4 - Total UK COVID-19 deaths by Region (for the week ending 26 June)

Source: ONS, 2020c

2.2 COVID's Initial UK Economic Implications

There are also reasons to believe that London's distinctive characteristics may make it more vulnerable to the negative economic implications of the crisis. Many of London's key sectors rely on proximity, agglomeration economies and externalities; others are dependent on tourists, business travel, and international students; and London's demographics, and hence workforce, are shaped by high levels of both short-term and permanent migration. And the global nature of the pandemic is a further risk: as the most internationalized part of the UK, London is more exposed than other regions.

So what do we know about the immediate economic impacts? On March 23rd the UK entered a national lockdown to prevent the spread of COVID-19. By closing non-essential businesses, enforcing social distancing measures and restricting international travel, the UK experienced a combined supply and demand economic shock. GDP fell by approximately 25% between February and April, although this is largely reflective of the temporary closures of many businesses (ONS, 2020b). The number of people on unemployment-related benefits rose by approximately 126% since the beginning of the lockdown to May (Inman, 2020), but this does not reflect the number of people on the two major government support schemes, the Coronavirus Job Retention Scheme (CJRS), known as 'furloughing', and the Self-Employment Income Support Scheme, which between them have at some point provided financial support to approximately 40% of the UK's private sector workforce (UK Government, 2020).

There is no doubt that the UK economy as a whole – in common with most other advanced economies – has seen the sharpest drop in economic activity in living memory. This negative impact seems to be broadly in line with London. As of 14 June, London businesses are reporting similar falls in turnover compared to the rest of the UK, with 64 per cent of businesses reporting decreases in turnover (Figure 5).

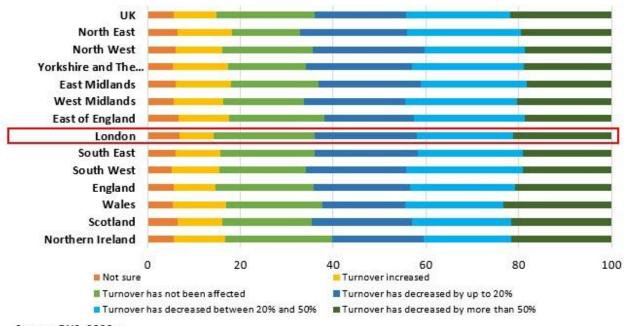


Figure 5 – COVID Impact on Turnover by Region as of 14 June (ONS Business Survey)

Source: ONS, 2020a

2.3 Impact on London's major sectors

Since February, nine sectors of the UK economy reported declines in GDP of more than 10%, with the highest drop coming from Accommodation and Food Services (-40.9%) (ONS, 2020b). Focusing in on London, the ONS estimates that these nine very negatively impacted sectors made up about 3.2 million jobs, or 53% of the city's total workforce, as of December 2019 (ONS, 2020i). According to a McKinsey study, almost a quarter of London jobs were estimated to be at risk of furlough, having reduced hours or being eliminated (Allas et al, 2020). This picture is supported by data on the uptake of the CJRS, which shows about 1.1 million furloughed employments in London⁵, the highest proportion of any region (ONS, 2020e).

Using this data, we estimate the number of furloughed jobs in London by sector using the national ratio of furloughed jobs to all jobs in that sector (Figure 6). We can see that some of

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⁵ This excludes employees for whom the region was unknown; including these, assuming an even distribution, would raise the estimate to 1.25 million.

London's largest sectors were hit hardest by COVID (Wholesale & Retail Trade, Accommodation & Food Services and Construction).

Figure 6 – Financial and Workforce Impact from COVID by Sector

| | Sector GDP Declines from February-April 2020 (UK Figures) | In Ooo's) | Positions in London (in 000's) |
|---------------------------------------|---|-----------|-----------------------------------|
| Manufacturing | ↓ -10.5% | 130 | 40 (31%) |
| Construction | ↓ -18.2% | 330 | 97 (29%) |
| Wholesale & retail trade | ↓ -14.5% | 653 | 211 (32%) |
| Transport & storage | ↓ -18.3% | 269 | 45 (17%) |
| Accommodation & food service | ↓ -40.9% | 461 | 257 (56%) |
| Information & communication | ↔ -6.1% | 507 | 56 (11%) |
| Financial & insurance | ↔ -1.5% | 396 | 22 (6%) |
| Real estate | ↔ -0.4% | 177 | 35 (19%) |
| Professional scientific & technical | ↔ -6.8% | 864 | 133 (15%) |
| Administrative & support service | ↓ -15.79% | 621 | 132 (21%) |
| Public admin & defence | ↔ 0.2% | 250 | 1 (0%) |
| Education | ↓ -18.8% | 441 | 32 (7%) |
| Human health & social work activities | ↓ -8.9% | 595 | 44 (7%) |
| Arts, entertainment & recreation | ↓ -20% | 190 | 66 (34%) |
| Other service activities | ↓ -22.7% | 178 | 47 (27%) |
| Total London Jobs | | 6,062 | 1,226 (24%) |

Source: ONS, 2020b; ONS, 2020e

While this economic snapshot does not include steps to ease the lockdown, it provides a conservative account of where the economic damage has occurred. For example, these figures do not account for reduced hours, redundancies or self-employed individuals who are receiving other government support. Moreover, as the CJRS begins to wind down, large organisations in the hardest hit sectors are starting to announce redundancies, eliminating some of these furloughed jobs entirely (Shapland, 2020). In the absence of a full recovery, and even allowing for the economic support measures announced by the Chancellor on 8th July, it is likely further redundancies will follow.

3. The Medium and Long-term Impact of the Pandemic

The statistics above provide an idea of the short-term impact the pandemic and necessary NPIs

(non-pharmaceutical interventions) have had on London's economy; but they do not necessarily provide a useful guide to the longer-term impacts. As set out above, London's economic structure is qualitatively distinct from other parts of the UK in terms of both its sector mix and diversity of occupations, which proved resilient during and after the 2008-09 financial crisis. It could be argued London is relatively well-placed to adapt given this economic diversity and large percentage of work-from-home jobs. However, the city's economic success is closely linked to its international connectivity, open-ness and 'global city' role, all things that could make it more rather than less vulnerable.

In this section we seek – recognising the uncertainties and without attempting quantitative forecasts – to identify the potential longer-term economic impacts. In some cases, the spread of the virus and the measures necessary to contain it have acted to accelerate already existing trends (e.g. e-commerce, work-from-home) in the economy and society. These economic shifts are likely to be long-term. In other instances, there have been severe short-term disruptions that might be reversed relatively quickly. Underlying both sets of impacts are the as yet unknown changes in behaviour of consumers, entrepreneurs, business managers and investors.

We believe it is useful to categorize these economic trends into seven broad types. Each has their own economic and sectoral implications, and they are also likely to interact with each other. These seven types are as follows:

a) Government Non-Pharmaceutical Intervention (NPI) Policies (Short-Medium Term) — Government lockdowns and NPI policies have closed non-essential workplaces, restricted movement, required individuals to stay at home and controlled international travel. While most restrictions are being lifted, requirements around social distancing, workplace cleaning/ safety and, for some countries, international traveller quarantines could remain for the foreseeable future⁶. While in place, these measures represent a

⁶ Some island countries have achieved, or are close to, elimination of community transmission of the virus (e.g. New Zealand), thereby reducing the need for social distancing at work. Full elimination of

simultaneous demand and supply shock, both reducing productivity and hence potential output, and suppressing consumption, at least to the extent that consumers do not substitute into other sectors. At the same time, these policies have had an extremely diverse impact on different industries. While restrictions in the UK are currently being relaxed, these may need to be re-imposed if case numbers rebound. This has happened in other countries and cities, with the UK's first city-wide 'local lockdown' having already been implemented in Leicester. An effective vaccine properly distributed might make these NPI policies redundant in 1-2 years. Overall, if these policies continue, they will impact sectors reliant on personal presence and/or contact far more than those where economic activity can be conducted wholly or largely online.

b) Demand Impacts (Short-Medium Term) — In the short-term, the potential supply of the economy will start recovering as restrictions are lifted, but there is considerable uncertainty about the path of demand. On the one hand, there is a substantial overhang of "pent-up demand". Many of those (the majority) who have continued to work, who have had their incomes wholly/ mostly supported by the CJRS, or who primarily receive income from non-work sources such as pensions and investments, will have increased their savings, since they have will not been able to maintain their pre-pandemic spending patterns. A recent Centre for London survey found that 17 per cent of Londoners reported that their disposable income has increased since COVID-19 began, while a third reported that their disposable income had not being impacted (Bosetti & Belcher, 2020). On the other hand, about 45 per cent of Londoners report their disposable income decreasing (Bosetti & Belcher, 2020) and that, coupled with the larger influence of uncertainty on business and consumer confidence, may mean overall economic demand will remain very low. Most economists believe the risks are more on

community transmission of the virus is not an explicit goal of UK policy at the time of writing, although it is a goal of the devolved Scottish Government (BBC News Scotland, 2020).

- the downside that demand will, in the absence of a major economic stimulus, stagnate but uncertainties are very high.
- c) Structural Reductions in Growth (Medium-Long Term) The short-term economic impacts, in particular job loss and business failures, may also reduce the potential level of output over the medium term via "hysteresis" effects or "scarring" where temporary reductions in demand translate into permanent reductions in supply. There are several channels through which "scarring" could manifest itself, including long term unemployment, reduced business investment and lower levels of education attainment. Portes (2020) suggests that "at-risk" GDP could be 12% in the short-medium term and 56.5% in the long-term. This in turn if not mitigated by policy measures would result in higher unemployment and lower real wages, meaning persistently lower levels of consumer demand both in the medium and long term.
- d) Changes in the Entrepreneurial Environment (Medium Term) Prior to COVID-19 investment in new companies was at all-time highs, with almost a third of European investment in new technology companies flowing to the UK and specifically London (Nicolle, 2020). As COVID weakens demand and devastates balance sheets, survey data suggests that 53% of high-growth companies are at moderate to critical risk of closing, which includes an estimated £22 billion of already invested equity and grant funding (Beauhurst, 2020). The initial structure of government business support may have exacerbated these risks, as start-ups were not initially covered by government policies. A £250m Future Fund has since been introduced to provide convertible loan notes to these organisations, but it is too early to tell the impact it will have (Skelton, 2020). Industry data suggests a considerable fall in equity or venture debt funding to start-ups and fast growing businesses in the UK over the past 4 months, with new, non-funded start-ups being particularly impacted (Plexal, 2020). This caution by equity investors and bank lenders resembles the 2008 Financial Crisis, where access to financing in the UK

was harder to come by for growth-oriented firms and evaluations by lenders were made primarily on company size (Cowling et al, 2012). It is not clear whether this impact is worse in London, and again, the sectoral composition in London (e.g. high proportion of tech companies) may imply greater resilience. On the other hand, taken together with potential post-Brexit challenges such as access to talent, this driver may negatively impact London's offer as a global centre for starting and growing new businesses.

e) Reduced Labour Mobility (Short-Long Term) – The London labour market was already facing a significant shock from changes to UK immigration policy after Brexit, in particular the ending of free movement with the EU. In the short term, immigration, emigration and business travel have largely ceased, but it is uncertain what the longer term impacts of the pandemic will be on labour mobility. The growth of London's labour force has been driven by international migration with more than three quarters of job growth and almost 1 million jobs (Figure 7) coming from international workers between 2004 and 2016 (Rocks, 2018). Those born abroad now make up 40 per cent of London's workforce and immigrants are also disproportionately likely to be responsible for start-ups and new businesses (Rocks, 2018; Lee, 2020). A reduction in labour mobility will have a disproportionate impact on London's economic growth (especially when compared to the UK), where the number of non-UK workers only amounts to about 13 per cent (Rocks, 2018).

Figure 7 – London Workforce Growth by Citizenship

| Country/area of birth of job holder | 2004 | 2016 | Change Numbers | % |
|--|-------|-------|-------------------|------|
| UK | 2,848 | 3,132 | 284 | 10% |
| Rest of the EEA (excluding the UK) | 304 | 748 | 445 | 147% |
| Any other country (excluding UK and EEA) | 844 | 1,389 | 545 | 65% |
| Total from all countries | 3,996 | 5,271 | 1,274 | 32% |

Source: Rocks, 2018

f) Changing Consumer Behaviour (Long Term) – With stores closed, there has been a further shift of retail sales to online purchases. Online sales accounted for 20% of UK retail sales before the pandemic (Sabanoglu, 2020), and has grown further as a consequence: as total of all retail, e-commerce accounted for 33.4% of sales in May

(ONS, 2020f). While other 'high-street' activities are likely to return (e.g. haircutting, pubs, dining), there are indications that the retail shift could persist and perhaps intensify. In China, where society has largely returned to normal, the high proportion of shopping online has continued, both in retail and groceries (Yang & Kidron, 2020). In addition to greater familiarity with e-commerce, consumers might now worry about crowds on public transport and in shops, and may be cautious about people-facing services. Adjusting to these new realities could be particularly problematic for entertainment and sports sectors, particularly large-scale events.

g) New Workplace Environment (Long Term) — There are three aspects to this. First, social distancing rules preclude the use of office space in the way that was the norm before the pandemic. Secondly, as many professional workers and others who have experienced working from home and 'e-commuting', new working situations are likely to lead to a shift in individual preferences. Since the start of the pandemic, 80 percent of people reported enjoying working from home and 21 percent said they were more productive than before (Boland et al, 2020). This changes the mindset and dynamic of having individuals work-from-home on a more regular basis. As well as considering how many *jobs* can be performed from home, it is also important to think in terms of which of the various different *tasks* that together make up a job need to be undertaken in an office location. Hence, we are likely to see a permanent move towards people working from home for at least part of the week. Thirdly, and partly as a consequence of the previous two trends but also in terms of cost-reduction, organisations will need to rethink how office space is used.

Hence, drivers of change will come from both the demand and supply side. Demand for office space will lessen as a greater proportion of workers and companies are likely to spend more time working from home/ outside the office. At the same time, social distancing measures are reducing the effective supply (and hence increase the price per worker) of office space, so some more expensive office formats will become unviable. This will also interact with longer term processes of white-collar automation that might

have office staffing implications (Baldwin, 2020). It is very difficult to predict how these trends will impact the competitive position of London relative to medium-sized cities/ towns, or how it will change the balance between central London and secondary centres outside Zone 1. Overall, as firms and workers move towards a hybrid system of working from home and in the office, the outcome may rest on which locations and which commercial landlords and owners can adapt their offer quickly.

4. Implications for London and its Industries

4.1 Sector-by-Sector Adaptability to COVID Trends

To assess the medium and long-term implications for the London economy we combine current effects of COVID with the identified business trends. This allows for a preliminary qualitative assessment of how well-positioned certain sectors are to adapt to new trends or whether they will have substantial difficulties moving forward (Figure 8):

Figure 8 – Qualitative Assessment of How Sectors will Adapt to New Trends

| Workforce Sector | NPI Policies Impacts Short- Short- | Demand Impacts | Growth | Changes in Entrepreneurial Environment** | Reduced Labour Mobility Short-Long Term | Changing Consumer Behaviour Long Term | New Workplace Environment | Sector's Overall Ability to Adapt |
|---|------------------------------------|--------------------------|-------------------|--|---|--|---------------------------------|--|
| | | Short- Medium Term | | | | | | |
| | | | Largest Employm | ent Sectors in Lond | ion | | | |
| Professional, scientific & technical activities | • | • | - | | • | • | • | •/• |
| Wholesale & retail trade | • | • | • | | • | • | • | • |
| Administrative & support service activities | • | •/• | | • | •/• | •/• | • | •/• |
| Human health & social work activities | | •/• | | • | •) | | • | • |
| Information & communication | | • | • | ٠ | | • | • | • |
| Accommodation & food service activities | • | • | | • | • | | • | • |
| Education | • | • | | ٥ | • | • | • | •/• |
| | ita 11 | Other | Significantly Imp | acted Employment | Sectors | | i i | |
| Manufacturing | • | •/• | • | • | | | | •/• |
| Transport & Storage | • | •/• | •/• | • | • | | • | •/• |
| Arts, Entertainment & Recreation | • | •/• | • | • | • | • | • | • |
| Construction | | | •/• | • | • | • | • | |

^{*}Tentatively short-term depending on existence of second wave ** Trend largely mimics current financial impact by sector

Able to Adapt to /
Not Impacted by Trend
Some Negative Impact on Business
Negative Impact on Business

While this assessment is necessarily preliminary and broad-brush, a reasonably consistent picture emerges. The professional services and information/ communication sectors, who were already shifting to more online and remote working, have been able to adapt more easily during the pandemic. Meanwhile, healthcare and social services are essential services, and are largely publicly funded, leaving them less adversely affected by lessening demand, NPI policies and consumer behaviour. For these industries, some changes to policies and workplace environments may be necessary, but output and employment are likely to be maintained, albeit perhaps at higher cost.

However other sectors appear vulnerable to a combination of lower demand and increased costs, resulting from reductions in travel and tourism, possible reductions in domestic consumer spending, and the continuation of social distancing and other policies (imposed by government or voluntarily adopted to promote confidence) designed to reduce the risk of virus transmission. This applies to accommodation and food service, wholesale and retail trade, the arts and entertainment sectors, and transport. Restaurants and food services appear particularly vulnerable: downtown workers will not be buying lunch in large numbers in the near future, tourists will not be eating at London restaurants and 44 percent of Brits say they are enjoying cooking more since the lockdown hit, a trend that may weaken the appeal of eating out again (Restorick, 2020).

Restaurants that rely on small margins will face serious financial difficulties if demand does not return. Even if demand does return, a larger proportion of sales may be through apps like Deliveroo or UberEats, which will require businesses to adapt their operations and will introduce a 'middleman' app that further cuts into margins. Arts and entertainment is likely to see demand return, but theatres and sporting venues many not be able to return at full capacity. As hard and expensive as it is to get tickets in London, it will be even tougher post-COVID as fewer tickets will result in higher prices (Lewis, 2020).

Implications from lower availability of financing and investment are spread across all industries but are most likely to affect new or smaller companies and those that have been unable to generate revenue over the past few months, especially retail-facing firms and transport companies. New start-up and scale-up company success will largely be sector dependent and follow demand/revenue trends within the overall economy but decreased entrepreneurial activity will no doubt have an impact on growth.

Given the importance of immigrant workers to London's economy – both in highly skilled and entry-level jobs – decreasing labour migration will affect all sectors, although the impact of this is unlikely to be felt until after companies start to grow again and job vacancies increase. The dynamics of this process are uncertain, in that reduced migration might help mitigate rises in unemployment in the short term, while constraining growth in expanding sectors over the medium to longer term.

Overall, this qualitative assessment is preliminary, but provides a high-level understanding of what trends each industry should be aware of and how companies might start thinking about how to adapt.

4.2 A Tale of Two Londons?

As noted above, London's service-based economy has always been a 'tale of two cities', comprising a set of globally competitive advanced producer services together with more locally focused sectors providing lower-value personal and household services. Both have grown in the last few decades and they are, to some extent, complementary. But our analysis suggests that the impact of COVID-19 may drive a sharper divergence. Weekly employment wages are substantially lower for jobs in heavily impacted industries and sectors that will not be able to adapt as well to new business trends (Figure 9). Moreover, these sectors have seen wages decline since the pandemic hit, which is not surprising but raises the question of how long it will take for wage levels to climb again (ONS, 2020g).

Figure 9 – Average Weekly Earnings by Industry & Ability to Adapt to New Trends

| Industry Sector | Overall Industrial Ability to Adapt | Current Average Weekly Earnings (Apr) | | |
|---|--|---|--|--|
| Highest Paying I | Large UK Industries | | | |
| Financial & Insurance Activities | • | £ 1,182 | | |
| Information & communication | • | £ 882 | | |
| Professional, scientific & technical activities | •/• | £ 720 | | |
| Manufacturing | •/• | £ 609 | | |
| Public Administration | •/• | £ 605 | | |
| Transport & Storage | •/• | £ 595 | | |
| Lowest Paying I | arge UK Industries | | | |
| Wholesale & retail trade | • | £ 471 | | |
| Human health & social work activities | • | £ 467 | | |
| Administrative & support service activities | •/• | £ 438 | | |
| Other Service Activities | • | £ 421 | | |
| Arts, Entertainment & Recreation | • | £ 360 | | |
| Accommodation & food service activities | | £ 227 | | |

Source: ONS, 2020g

Initial research on US data confirms this. Rio-Chanona et al.'s (2020) analysis shows that supply shocks were likely to hit the poorest workers most, and individuals in these industries would have the hardest time performing their necessary tasks at home. Dingel and Neiman's (2020) calculations predict that 37 percent of jobs can be done at home, with more work from home jobs available in large cities compared to smaller cities/ towns. Finally, a paper by Barrero et al. (2020) suggests that 42 percent of initial US staffing reductions will not return, primarily from businesses that were forced to shut down or at firms that cannot afford to keep trading. While that number may not be as drastic in the UK because of the furlough scheme, there will likely be some permanent job loss, especially given the 10.5 million individuals either on furlough or self-employed government schemes (BBC, 2020) who are largely in lower-income jobs.

Moreover, vacancy numbers in hard-hit industries have declined by over 50 per cent and the total number of vacancies in the UK is at the lowest levels since 2008 (ONS, 2020h). With fewer available jobs in lower wage industries, those workers will have a tougher time getting back into the workforce, especially as the furlough scheme winds down. Overall, it is clear that there are important differences between London's relatively strong financial and professional services sector that has so far been able to adapt to new working conditions, and sectors such as tourism, cultural and people-facing service sectors that have been adversely affected by lockdown measures.

4.3 The Sectors in Between

Our qualitative analysis of the new COVID business trends in London provides a good idea of the effects on the most and least adaptable sectors of the economy, but what about the ones in the middle? Companies in these industries might have continued business through the lockdown or did not furlough workers at as high a rate as others, although they face considerable challenges moving forward. These sectors include manufacturing, public administration, health and social work, education and administration/ support services. The most at-risk jobs in these sectors are likely to be in manufacturing and administration/ support services, which also face the pre-existing threat of automation and/or offshoring (Baldwin, 2020). As the furlough scheme ends, up to 70% of manufacturing companies are either considering or drawing up plans for redundancies (Inman & Elliott, 2020) and without offices to work in, a number of administration/ support staff who have been furloughed may not be considered necessary.

The other three middling sectors also face some uncertainty. While most health and social work will continue as essential, fears of close contact may impact visits to the dentist, physiotherapy and in-person social work programs. The industry also currently boasts the highest number of vacancies in the country (ONS, 2020h), and is very reliant on migrant workers, leaving it vulnerable to declining labour market mobility (PWC, 2017). London's large education and public administration sectors are currently shielded by the ability to work from

home and access to public funding, but declining international student enrolment at universities and potential budget tightening from the government (as well as its stated intention to move some civil service jobs out of London) might leave these two sectors vulnerable to medium-term economic trends. With this being said, the diversity within all of these sectors makes it difficult if not impossible to predict which sub-sectors will be adversely impacted and which will not.

Of course, a pure sector focus ignores the significant interactions between these sectors. For example, business activity in the four lowest paid industries is linked in part to higher-paid individuals' spending at restaurants, cultural events and other service activities (e.g. house cleaning) and to providing support services to office workers. More widely, and over the longer term, one must consider how these industries form part of the broader offer that makes London attractive to skilled workers and entrepreneurs. If restaurants are lost and shows are inaccessible, it may become harder for firms to recruit and retain even in sectors that have not necessarily been directly adversely affected. London's offer may decline in relation to competitor global cities, depending of course on how well or badly those cities manage the pandemic. There may be a secular decline in the relative attractiveness of global cities as a group vis-à-vis medium sized and smaller cities, that can offer other types of amenity, lower housing and other costs, and greater space. The spillovers and agglomeration economies that have spurred London's growth, and its prestige as a global city, will remain but perhaps be less decisive.

4.4 The future of London's economy

So it would be naïve to think that the economy will revert to exactly the same shape as on the eve of the pandemic. What this indicates is a potential medium- or longer-term re-structuring of London's economy. Part of this re-structuring has been underway pre-COVID, like shoppers moving online, London employment declines in certain industries and an increase in working

from home. These trends have been accelerated and to some extent changed permanently by the impact of both the virus and the NPI measures taken.

It is unrealistic to imagine a future in which lower-value sectors continue to decline, while higher-value sectors, especially advanced producer services, continue to increase without limit. The inter-connectedness of a complex city economy suggests that new or expanded lower value sectors will take the place of those in decline (e.g. more delivery drivers, fewer restaurant staff). Re-structuring and reallocation per se is not economically 'bad', particularly if it leads to a more efficient allocation of capital and labour and a shift in activity to sectors which are either growing or where London has comparative advantage (or both conditions are true). However, the specific aspects of the pandemic, and NPIs taken in response, can lead to the collapse of some perfectly viable businesses due to short-term cash flow issues, which is not economically efficient. In addition, the practical workings of the economy rarely conform to the textbook smooth transition of capital and labour. In practice, this restructuring, unless handled much better than previous economic transformations, can lead to the failure of viable businesses, unand under-employment, increased inequality and under-investment. We do not examine the public policy challenges this poses in this article, but they are likely to be considerable.

5. Conclusion

The attention COVID-19 has received from both a health and economic perspective is both unprecedented and warranted. As the world reacts to the impacts the virus has caused—and is still causing—the speculation and predictions concerning future scenarios are widespread. In this paper, we have attempted to bring together the various trends triggered by COVID into a succinct typology that qualitatively assesses each sector of the economy, and specifically evaluates their impact on London, considered as a large urban economy with both a local and a global role. The impact on London is therefore relevant both to the UK because of London's size and influence in the national economy, and also has implications for other global cities.

It is clear the COVID pandemic has had an unequal effect on different sectors of the economy, leaving people-facing companies with major financial and personal impacts, while firms in other sectors have been able to adapt more easily and even grow. We expect this divergence to continue as trends point to increased online consumer behaviour, reduced overall demand and a re-shaping of workplace environments. Whether a vaccine is discovered in the near-term or not, it will be extremely difficult for certain sectors of the economy to bounce back to previous levels of revenue and profit. Without a return in demand, lower-wage workers in London (and likely other cities) will be disproportionately affected, creating further economic inequality, and increased reliance on the welfare system. With that being said, we still believe London has the durability and the economic diversity to adapt and recover, but to do so in an equitable way will require significant and targeted intervention from both national and local government

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