# KIBS in the times of COVID-19

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## 1 Introduction

Knowledge-Intensive Business Services (KIBS) have attracted a great deal of attention in the 25 years since the term first began to be used. The term refers to organisations – generally private businesses – providing expert support for business processes in both the public and private sectors. Much of this involves responding to problems that their clients bring to them, and this is often with highly customised solutions (though some KIBS, such as accountancy, provide many fairly routine services.) Occasionally the firms may be more in the business of creating opportunities, developing solutions that they can sell on to clients – for example, marketing services may spot consumer trends that they can suggest their clients should be innovating for, R&D or computer services may develop IP that they can license to users (e.g. the results of biotech R&D can be sold on to pharmaceutical companies).

Some KIBS are traditional professional services, like accountancy, legal, consultancy and advertising services (where the expert knowledge typically concerns administrative affairs, complex organisations and rules, and sometimes more cultural affairs). Some are more closely associated with scientific and technological knowledge, such as engineering, technical testing, R&D and computer services. In terms of statistical coverage, these are the industries represented into the NACE (version 2) codes as Section M (Professional and Technical Services), together with computer-related and information services that are part of NACE’s Section J. They are differentiated from the more operational business services captured in Section N (Administrative and support services), not least because KIBS typically have large shares of highly-qualified employees in their workforce – they rival public services like Education and Health services in this respect, and substantially exceed most other industries that may be “knowledge-driven, but that feature large shares of less qualified staff in front-line jobs (such as finance and telecommunications) or in manufacturing production roles (such as high-tech manufacturing).

Why should the future of KIBS – and most immediately, how they may fare in the wake of the COVID-19 pandemic - concern us? These are not, after all, industries that are directly involved in tackling the questions of reducing spread of the disease, developing vaccines, caring for infected people, developing new treatments for the illness(es) associated with the SARS COV-2 virus – or are they? Actually, some KIBS are important here – technical R&D and testing services may well play a role alongside public research and testing facilities, for example while marketing, consultancy and social research firms may be active in monitoring and modelling population behaviour alongside public statistical agencies and the like. Governments may employ KIBS when their own capabilities (and those of Higher Education) are under strain. But many KIBS will be involved in more “mundane” activities, and the concern about their future rests on two main features. First, many KIBS are important in forming what has been called a “second knowledge infrastructure”, as being instrumental in securing the flow of specialised knowledge around the economy, and acting as agents that fuse generic knowledge with understanding of the localised problems that their client organisations confront, thereby creating solutions to these problems. Indeed, much of the research interest in KIBS over the last two decades has concerned their role in national and regional innovation systems – in helping clients do new things, and/or learn how to create new things. Second, KIBS have been a major source of growth in employment (and high-skill employment at that) and value-added/output in practically all advanced economies over the course of this century (and for several decades before). Currently the NSO estimates that employment in Section M alone was over 3 million in 2019 (about a tenth of all UK employment), a doubling of the 1992 figure and a trebling of that in 1979 (total employment in both 1992 and in 1979 was about 4/5th the current figure).[[1]](#footnote-1) These statistics, furthermore, do not take into account computer services, one of the largest KIBS industries, with almost ¾ million employees; it, like several other KIBS is an important contributor to UK exports, albeit “invisible” exports (as services almost invariably are). The KIBS industries, then, are important in economic and innovation terms, and while they may not attract as much media attention as airlines, fast food, and tourism services, they are liable to be rather important in whatever recovery is achieved in the wake of this pandemic. Organisations of all sorts will find themselves confronted by problems of all sorts, and KIBS are often sources of assistance in problem-solving.

There are few precedents for the current crisis, so it may not be very helpful to point out the experience of KIBS in and following the Great Recession of 2008-9. This was widely seen as a crisis of service industries – mainly, but not entirely financial services, who were the epicentre of that crisis. There was indeed a sudden drop in KIBS’ growth, both in employment and output terms, as the Recession hit their clients, within a very few years most KIBS sectors were growing again at the same rate as before, or even more rapidly. This was a phenomenon across most industrial economies, though with variations related to the Eurozone crisis, for example. But the impact of the pandemic is liable to be far deeper than that of the Great Recession, with overall toll on GNP and employment levels expected to be greater than anything seen in peacetime since the Second World War. Additionally, this crisis is not only going to be quantitatively more severe than the Great Recession: it is already apparent that it is qualitatively different, in ways that are still the subject of fierce debate.

That brings us to another reason for being particularly interested in the future prospects for KIBS in the age of COVID-19. This is that the measures of social distancing established by the UK government (and most others) to limit spread of the coronavirus from person to person, have particular impacts on KIBS work. These measures affect the ability of employees to work in close physical proximity, with other team members and with clients. Restrictions on travel and related services also affect traditional patterns of KIBS work.

The workforce in KIBS is largely composed of professional workers, deploying “cognitive skills” related to their areas of expertise and knowledge. In general, professional workers are far more able to conduct their work in socially distanced ways, most notably by working from home, supported by use of telecommunications (telephony and Internet), computers and smart phones and the “apps” that run on them, and both corporate and public databases – what used to be known as teleworking. In contrast, work that relies centrally on physical and social skills – for example, construction and care services, farms and fishing, restaurants and retail – is more difficult to restructure in accordance with social distancing measures. KIBS’ professionals, however, are involved in processes that typically involve teamwork and most importantly, interaction with their clients. Indeed, a topic of debate for many years has been the close geographical proximity that many KIBS display with their major clients. Face-to-face interaction is seen to be important for establishing the trust relationships that re needed in many of the services involved, where the client may well have to share confidential information and provide information about its problems with the KIBS firm. There may need to be substantial ongoing interaction as mutual agreement as to the diagnosis of the problem, the types of solution and the details of the particular solution to be implemented, the process of implementation itself and the evaluation of outcomes, has to be established. Admittedly, some KIBS activities are fairly routine, requiring only that data be delivered from the client to the service firm, who processes it in appropriate ways and then returns the results and any related advice: such services may be accomplished via digital communications with little human contact. But levels of customisation are often very high in KIBS, and establishing and maintaining effective relationships without physical elements – purely digital relationships – has proved difficult to date.

While the more extreme social distancing measures are liable to be relaxed fairly rapidly, it is likely that – even if we do not see a substantial recurrence of COVID-19 – some measures will stay in effect for a long time. The threat of future pandemics will probably be widely recognised, and organisations of all types will need to put into place contingency plans and preparations. KIBS will themselves be at least as affected as businesses of other types, and they will need to tailor their service offerings to the changed environment confronted by their clients. And, of course, their clients will be experiencing the economic shock induced by reactions to the pandemic (including, but going well beyond the social distancing measures), for a long time – and some clients will have succumbed to the shocks, and been forced into bankruptcy or substantial reduction of activities.

In order to think through these issues more systematically, I have broken down impacts of the pandemic into three categories. The first concerns the direct effects of the disease itself – illness, death, stress on health and other services. The second concerns immediate consequences of policy responses to the threat (and in some locations, the reality) of the pandemic spiralling well out of control. The third concerns the longer-term implications of this experience, and is necessarily more speculative. For each category I will set out a very brief summary of major impacts (and responses), as I see them, for KIBS and for the demand for services from their clients. This will be very largely based on anecdotal evidence and historical parallels. I would welcome suggestions for further issues to consider, and examples that support or undermine my appraisal.

## 2 Impacts of the Pandemic.

The virus behind COVID-19, SARS-COV2, has features – notably, but not only, transmittability and lethality – that have resulted in many deaths, and a great many more periods of illness, with serious illness and mortality much more common among older people and those with various pre-existing health problems. The impact on the workforce is considerably more than the annual flu with which we have been accustomed. Many KIBS are small businesses, who can be severely impacted by the loss (even if temporary) of several key members of their workforce. Activities may need to be rapidly reconfigured to enable business continuity in these circumstances.

KIBS’ clients will face similar impacts, and services that can help with immediately securing continuity, or help support a “graceful degradation” of their operations, are likely to be in demand. Business continuity services are supplied by computer-related KIBS and consultancies, with a particular focus on recovery of IT systems (“disaster recovery”). Employment-related services are typically regarded as more operational services (and thus located in NACE Section N), though anyone familiar with head-hunters will be aware that these can be highly knowledge-intensive. KIBS in areas such as marketing may be invoked to enable clients’ communication with customers and stakeholders, who require explanations of such things as delays and difficulty in accessing the clients’ services.

The immediate impacts of the pandemic on public services, in addition to the impacts on business processes that are common to most organisations, are liable to be strongest within health-related services, of course. As well as suffering illness among their own employees, they are liable to be stressed by a large influx of patients with somewhat unusual features. Again employment services may play a big role, but we could see KIBS involved in technical testing and the like playing roles in supporting beleaguered hospital laboratories. Management of public service responses can sometimes be contracted out to what Deanne Julius named “the public services industry”. One less than happy case of this was reported in April 2020. The UK Government hired the professional services firm Deloitte to help the national scaling up of testing services, which had been overwhelmed by increased demand. Around 50 testing sites around the country were to be supported in logistics and other ways by the firm. (Along with other aspects of the effort to expand testing, the performance here was criticised as inadequate. So much so that *The Guardian* reported that some local hospitals sought to take over control of the operation from Deloitte.) Similarly, PA Consulting were commissioned to coordinate the manufacture of ventilators another crucial part of the public service response to the pandemic which had been underresourced.

The immediate impacts of the virus are considerably less than they would be in the absence of government policies aimed at limiting the spread and intensity of the pandemic (flattening the curve”). But these policies themselves create intense problems for business processes, and uncertainty as to how long they will last only intensifies these.

## 3 Impacts of the Policy Responses to the Pandemic.

The policy responses to the pandemic have varied across countries, and over time. They include *measures to limit the spread of the virus*, especially more or less stringent social distancing, involving, for example, restricting the activities of hotels, restaurants, cafes and bars; requiring businesses to shift work online as far as possible, and restricting travel to work for employees in non-essential industries; closing or limiting use of many public facilities, and requiring vulnerable parts of the population (and sometimes many more) to remain at home. Testing systems, to determine the spread of the disease by identifying cases and locate contacts of infected people, are employed to various extents in several countries, and apps to allow smartphones to identify such contacts are being introduced. Other government policies involve *strengthening health and related services* so they are better able to deal with cases of COVID-19, and *supporting research programmes* to better understand the virus and its modes of operation, the epidemiology of the pandemic, and the impacts of the pandemic and of policy responses themselves. Finally, there is a huge variety of policies dedicated to *supporting businesses and employees* affected by the social distancing measures, by means such as loans, grants and welfare benefits. Governments have clearly been learning about policies and associated policy rationales, and responding to lobbying from business, media and public opinion; scientific advice of different kinds – including medical and related expertise, as well as inputs drawing on behavioural sciences – has also been drawn upon.

The various types of policy response have had numerous intense impacts on organisations of all sorts. Some businesses are effectively closed – many cultural, recreational, entertainment and personal services, much of the retail and consumer services industries, for example. Others have dramatic decreases in demand or need to curtail operations substantially – transport sectors, other parts of retail, construction, educational and social services, even swathes of Agriculture, Forestry and Fishery, and much manufacturing. A number of activities have increased levels of demand – online retail, broadcast and online entertainment (and news) services, for example insurance industries (while traffic accidents are reduced, compensation claims concerning travel and tourism-related disruptions, and probably ones related to inadequate safeguarding of employees in threat of infection). Even when organisations cannot shift operations online – many professional and public service organisations can to some extent interact with their clients and deliver informational elements of their services – they may need to enhance communication capacities. Across all sectors, customers, clients, business partners and other stakeholders are liable to require information as to what the disruption to services and supply chains is liable to mean, what their options are, what the other parties are liable to do. Many organisations are struggling to respond adequately to a surge in queries and complaints. Of course, many businesses are confronting calamity, as their revenue stream dries up, as necessary supplies and building work are frozen, as bills continue to become due.

This context creates enormous difficulties across the economy, and KIBS are affected both as being under similar duress to other industries, and because their clients are also experiencing this. In terms of direct impacts, it is apparent that social distancing and travel restrictions render many of the longstanding practices of KIBS firms problematic. Face-to-face contact with clients is typical in many KIBS’ activities of problem definition, solution implementation/delivery and evaluation. Team working is common in KIBS’ projects, and has been a substantial part of the training and mentoring of less experienced employees. While much of this activity can be largely conducted using online communications and databases, such media are limited where it comes to communicating body language cues, facilitating informal interactions (often the site of creative and informative exchanges), and establishing the close relationships that are required for effective KIBS operations. Adaptation to such changes will be easier for those KIBS producing more routine and standardised services, and we might see some shift away from high customisation to forms of standardisation (including something more akin to “personalisation”, where a common core of activities are modified only in respect of more client-specific details – the data entered into a tax return or the names, images, product details, etc on a client’s web site, for example) among many types of KIBS. Those most agile at adaptation to new ways of working will be more likely to survive the downturn of demand for many KIBS, although the need to establish trusting relationships may also drive KIBS to working more with established clients. Creative ways of establishing such relationships may be developed. KIBS already employ various ways to signal their trustworthiness, reliabilty and ability to confront client demands, for example by publicising client feedback and employee credentials, securing industry awards and coverage in trade journals and conferences, and demonstrating their innovativeness through news coverage, etc. However, these open the door to establishing trusting relationships, and novel ways of proceeding beyond this will be at a premium.

Other impacts for KIBS will reflect the impacts on their clients. In some cases this has already meant a substantial drop in demand for KIBS services, as exemplified by the 42% drop that ITV reported in its advertising revenues during April 2020. One recent report suggested that global consulting fees could drop by 20% in 2020. Legal services are having to deal with postponement of many cases they are handling (and are concerned about a large backlog of business law cases, which will need addressing once something like normality returns to law courts).

KIBS have responded in various ways to the drop in demand for their services: furloughing or dismissing employees, reducing working days, slashing expenses (some, such as travel costs and conference expenses are reduced in any case). A great topic for future analysis is whether it is bigger or smaller companies – most KIBS are SMEs, but there are large global firms in many subsectors – that are most able to save costs in these ways.

Not all services face a drop in demand. Digital advertising has grown, if that of broadcast TV has declined. Organisations of all types may face new problems, and thus require increased KIBS’ support. One set of problems surround labour (and other stakeholders’) responses to the adaptations undertaken in reaction to the pandemic and its policy responses. For example, legal challenges of various kinds may be raised about working conditions – changes that render work environments less comfortable or ergonomic, inadequacy of social distancing and hygiene measures, changes in work content, and the like. Businesses (and public health and social care organisations) may be taken to court by consumers, clients, and patients, if they can be seen responsible for exposing individuals to the virus, or making insufficient allowance for their ill-health: as well as legal services supporting individual and class actions (which are more like B2C services), legal KIBS will be deployed by businesses and other organisations fighting these claims. Likewise, insurance companies turn to KIBS where it comes to disputed claims, and there are liable to be many of these in the wake of the pandemic.

Less predictable developments concern the type of services that clients demand of KIBS. They are facing new business problems, and while some firms may prefer to tackle these with internal resources rather than spend money that is now much scarcer than expected. Some are bound to turn to the specialised knowledge of KIBS. Furthermore, some KIBS may seek to gain new clients, or secure the loyalty – and even the survival – of existing clients. For example, one Manchester-based accounting firm is contacting clients by email and telephone concerning how they are faring under current circumstances, publishing relevant information and advice on the web, and even running webinars for their clients. In this case, the focus is very much on government-backed emergency financing schemes, issues in furloughing employees, and other largely financial issues. It is easy to imagine other firms offering similar support where it comes to managing social distancing measures in internal operations, in communication with customers, and so on.

One set of KIBS is already active in relation to new business problems – IT services firms see social distancing as the obvious technological fix for many of the challenges connected with social distancing and reduced travel. Indeed, there has been an explosive growth in the sorts of remote work and videoconferencing that these firms have been advocating, and cloud-based services also appear to be booming. Consultancy services that support users in adapting to use of such tools have been relatively underdeveloped, but it can be anticipated that many KIBS – not just existing IT consultancy services, but KIBS addressing a range of management issues – will experience requests from clients as to the issues involved in digitalisation.

Not everything can be readily digitalised. The activities of many organisations require employees working in physical proximity together, or with customers, or where its premises or vehicles are liable to bring people into proximity. Confronting these complications is another aspect of social distancing that creates new business problems, and support of various kinds can be provided by external sources. KIBS may provide basic advice to their clients (as in the case of a service that assists charities with their financial management, and has begun providing them with information as to how they may structure their operations so as to continue working); they may also facilitate networking and sharing of experience among clients. Where the issues are mainly about issues concerning personal behaviour (maintaining physical distance, hygiene, face-masking, rules about queuing, etc.) or use of facilities (hot-desking may be discouraged or require regular cleaning of surfaces and keyboards, café facilities and shared utensils may be suspended, etc.), standardised advice may be sufficient. Where working, transport or other arrangements require much more restructuring, which may often be the case in, for example, factories, construction sites, and warehouses, more sophisticated design may be required – probably stimulating the need for engineering and industrial design services, along with those parts of management consultancy focused on work organisation, employee relations, and customer relationships.

The topic of customer relationships was discussed in the previous section, as an area where business communication and marketing services are liable to play important roles in helping clients respond to the disruptions that the onset of the pandemic has presented. It is liable to present persistent headaches for organisations of all sorts, as they confront damaged economies and supply chains, uncertain markets and business partnerships – with varying circumstances around the world (as international businesses are well aware). These, and other factors, are liable to dramatically affect not only ecommerce and ebusiness, but also a wider range of B2B and B2C communications. Strategy consultancy of various kinds is liable to encounter clients searching for solutions to both immediate and long-term dilemmas.

The discussion above has focused on the responses of KIBS firms to the challenges presented by the pandemic, the policy responses it has generated, and the impacts that both of these have. However, it should be borne in mind that the sorts of services provided by these firms may also be supplied, at least partially, by other parties. As already noted, government agencies, industry associations, HEIs and others can provide advice and other types of support to businesses and other organisations. (Governments may establish policies to support particular modes of supporting businesses – these may benefit or undercut KIBS.) Furthermore, some established KIBS may face new types of “competition” as increasing numbers of potential clients may turn to online resources for help with some of their business problems. Just as GPs have been finding patients turning up in surgeries with print-outs of advice that has been obtained from health websites, and financial advisors need to be aware of what is being provided in online communities and websites like moneysavingexpert.com, so much advice and experience-sharing may be disseminated using the Internet. As well as free resources, we may find would-be disruptive innovators appearing, that offer (usually pared-down) alternatives to conventional KIBS. There had already been discussion of disruption in areas such as fintech, lawtech, and crowdsourcing in areas like design and research; more moves here can be expected.

## 4 Longer-term Implications.

It is far from clear how long the difficulties associated with the pandemic will persist. Even if a suitable vaccine can be developed rapidly and produced on a sufficient scale to immunise much of the world’s population, there is speculation that SARS-COV2 will be able to mutate readily and reinfect people with immunity to earlier strains, much as winter influenza does. Like influenza, it may join the common cold as a regular widely encountered disease (though possibly a more serious one in terms of health impacts). Some of the measures introduced to manage the COVID-19 crisis may be applied on a continual basis, at least in some regions of the world. Even if this dire scenario does not materialise, many (sadly, not all) policymakers around the world have woken up to the possibility of future threats of other emerging diseases (or more virulent varieties of familiar diseases). Efforts to render societies and economies more resilient to such pandemics – not least, by instituting capabilities to respond rapidly to outbreaks – are a very likely consequence.

Furthermore, the OECD has described current developments as constituting “a major economic crisis that will burden our societies for years to come”. Other authorities have suggested that this crisis is liable to be deeper than anything confronted for centuries. Even if these dire warnings are excessive, we can be confident that there will be many businesses in trouble of one sort or another. Already the long trend to globalisation was being challenged by domestic and international political disputes. (“Populist nationalism” has been on the rise in many countries, with other countries seen as harbouring hostile intent.) The difficulties occasioned by reliance on long-distance travel and transport, and on overseas sourcing of what proved to be critical products, are liable to lead to a rethinking of global activities. (9/11 was widely seen as likely to reduce trends towards global just-in-time systems, and the like, but these impacts were muted – the current crisis is almost certain to produce much more fundamental changes.)

Such developments may well mean that the implications discussed above for KIBS, in light of immediate impacts of the pandemic and associated policy responses, could well be longstanding. This is not to say that they will not evolve, with, for example, some established KIBS consolidating the innovative services they have rapidly begun introducing, with some existing firms specialising in these areas, and quite possibly with new entrants playing a role here. We can imagine such activities as social distancing accreditation systems, pandemic readiness auditing, and pandemic-related resilience and recovery planning services, training of management and key employees. One interesting development could be the emergence of new varieties of design specialisation. The new service of service design, recently appearing alongside “traditional” industrial and product design service industries, may be boosted by need to redesigning service facilities and user “pathways”. We can expect both support for organisation and work processes to enable long-term systems of social distancing, high hygiene, etc, and to build in ways of achieving rapid shift in such practices if necessitated. Logistics has been a major topic in the current crisis, as essential chemicals, equipment and protective clothing have been in short supply (or in the wrong locations), and this too is liable to garner more attention.

With many businesses facing long-term market disruption, and confronting collapse or at least severely slashing activities and workforce, professional services supporting them and their stakeholders through these travails are liable to have their hands full. Governments and intergovernmental organisations may seek to provide financial and other resources to beleaguered businesses – and to public services like Universities, to local government and to charities. These resources will often be provided on the basis of adequate business plans and commitments as to how to operate, and national governments may find it hard themselves to evaluate the response to these demands, and to assess the resulting performance of beneficiaries. This implies an increased demand for services that can evaluate organisations and their plans, in terms of sponsors’ criteria. Such criteria may vary widely according to sponsors' aims and objectives, and the systems they put in place to align these with the ongoing crisis. We can imagine financial services and other parties to undertake such analyses, but would expect KIBS such as accountancy, consultancy, and even research firms (some social science R&D firms conduct policy and programme evaluations) to be active here too.

Services supporting international businesses may be hit by disruption to international trade, and a possible retraction of some transnational businesses from some of their global markets. But new patterns of international trade, possibly involving new value chains and lead markets, and government demands for more locally-based production facilities, may require assistance from consultancy and marketing services, among others. International tensions may or may not grow, but in recent weeks there has been a succession of warnings from Western security authorities about “foreign power backed” efforts to hack into COVID-19 relevant organisations (on top of quite longstanding concerns about attacks on critical infrastructures). One obvious result, in terms of KIBS, is an ongoing growth in demand for cybersecurity services.

More profound change in economic structures is advocated from many sources, who see the disruption of “business as normal” as an opportunity to press for substantial shifts in the trajectories of change that “normal” has been leading to. While some voices agitate for protectionism or at least greater self-reliance, on nationalistic grounds, others reiterate the urgency of addressing the climate crisis. The latter voices may highlight the environmental benefits that the reduced economic activity has (patchily) brought, and stress that any recovery should not favour unsustainable patterns f production and consumption. Thus, for example, policy instruments providing financial support to badly-hit industries, should be tying such support to clear undertakings to reduce wasteful and polluting activities, to focus much more R&D and innovation effort on greener technologies, and so on. Some KIBS already specialise in such areas – “green” marketing, design, R&D and similar services. These may have an important role to play in the success of efforts to shift trajectories of change toward wide-ranging transitions in our economies.

## 5 Conclusions.

This brief note has set out some of the key issues confronting KIBS as a result of the SARS-COV2 pandemic. While many of the details set out above may be revised with hindsight, the expectation that there will be major long-term impacts is credible. These will vary across KIBS of different sectors, sizes, and in different locations and with different specialisms. Many of the firms are likely to face severe difficulties, especially if they hope to continue with anything like “business as usual” on the anticipation that “normality” will be restored. There are likely to be opportunities for new services and possibly new markets, and there will be ongoing pressures to adapt to new ways of working. Many assumptions about how their services are produced and delivered are liable to be undermined.

Most of these points can be made about many other sectors of the economy. Some are like KIBS in being “knowledge-intensive”, in the sense of featuring large shares of highly qualifies people in their workforce – especially public services like health and education services, but also in certain arts and entertainment activities, and particular specialisms within, for example, financial services, and some of the subsectors of Section N (administration, etc). Some involve much B2B contact (often services with substantial business and consumer markets) and issues of physical contact and proximity arise for them. Charities, membership associations, and the like often have structures similar to KIBS, too. Meanwhile, the sorts of services to external clients provided by KIBS may be parts of the portfolio of organisations in other sectors – HEIs can supply R&D and consultancy services, telecommunications and publishing firms can supply information services, financial institutions can provide various advice services, along with insurance and other services, and so on. Sometimes these are commercial extensions of activities they produce for internal requirements, sometimes they represent opportunities spotted by businesses to exploit spare capacities or to enhance customer loyalty (or lock-in). The discussion about KIBS in this note, then, has implications for many other parts of the economy.

But we should conclude by reiterating the point that KIBS are important for the whole economy. They perform functions that require specialised knowledge that their clients do not have in sufficient quality or quantity. As such they are important agents in supporting the operations of complex modern economies. They may play substantial roles in aiding the rebound and/or restructuring of these economies as the immediate threat from the pandemic subsides. What is more, our economies continue to face the major challenges associated with the climate crisis and a host of other looming ecological – and existential problems. If we are to achieve transition to more sustainable ways of producing and consuming goods and services, KIBS could be playing a major role in producing, sharing and implementing relevant knowledge – as some “green” KIBS now dedicate themselves to doing. KIBS in general are responding to demands from clients, so their contribution to a transition to greater sustainability will be very much a matter of businesses recognising that they must confront environmental challenges. That recognition in large part is driven by regulatory pressures (together with pressures from businesses’ own clients and consumers). Governments seeking to promote sustainable economies and ways of living can make sure that KIBS play their role, by encouraging production of relevant knowledge and by ensuring that businesses recognise that environmental problems are their problems.

1. <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/timeseries/jws9/lms> accessed 4 May 2020. [↑](#footnote-ref-1)