



FIRES-Reform Strategy for the UK

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Executive summary

Introduction

In Part I we have introduced 64 proposals for a more Entrepreneurial Society in Europe. Inevitably, however, these proposed reforms are general and motivated from a broad base of evidence and scientific debate. The resulting table thus gives us a menu of possibly useful interventions that would have to be implemented at different levels in the European Union. To support more entrepreneurial venturing in Europe, however, institutions need to be supportive of individual entrepreneurial ventures “on the ground”. That is, supporting institutions should work in very specific contexts. To implement an effective strategy, European policy makers therefore must work simultaneously and coherently across policy making levels and jurisdictions. Reforming e.g. intellectual property rights protection is an international discussion, whereas proposals related to taxation, social security and education are typically matters of national or even regional policy, while policies to promote knowledge exchange between academic and research institutes and the local entrepreneurial ecosystem, is best organised at the regional or local level. In recognition of these layered interactions, we have carefully analysed the relevant policy making institutions and their legal and political competencies on the nine areas of policy making identified in Part I of this report. The results of that analysis in FIRES working package 6 are reported in detail in D6.2. With that analysis in place we now present our seven-step approach to formulating an effective reform strategy at the country level.

- Step 1: Assess the most salient features of the institutional complex in place and trace its deep historical roots (WP2).
- Step 2: Assess the strengths and weaknesses and flag the bottlenecks in the entrepreneurial ecosystem using a structured data analysis (WP4).
- Step 3: Identify, using careful primary data collection among entrepreneurial individuals (i.e. founders) what most salient features characterise the start-up process and where entrepreneurs face barriers (D5.1).
- Step 4: Map the results of step 2 and 3 onto the menu of policy interventions developed in Part I of this report to identify potential interventions for the country under investigation.
- Step 5: Carefully consider the list of proposals in light of the historical analysis under step 1 and fit the proposed reforms to the relevant local, regional and national institutional complex in place.
- Step 6: Identify who should change what in what order for the reform strategy to have the highest chance of success (WP6).
- Step 7: Experiment, evaluate and learn and return to step 1 for the next iteration.

In this second part of this report we will illustrate this cycle from step 1 to 5. Step 6 is described in D6.2 for Part I and D6.3 reports on the results of the policy round tables where the draft reform strategies developed here were discussed. As we cannot implement the proposed policies to execute step 7, instead we have summarised the resulting reform strategies for Italy, Germany and the United Kingdom into three policy briefs that were presented and discussed with policy makers in these respective member states. The policy briefs and summaries of these round table discussions in the annex complete this deliverable.

Step 1: Historical Roots of Institutions and Recent Policies

1.1 Global Empire and Splendid Isolation: A short history of The United Kingdom

In its current form the United Kingdom of Great Britain and Northern Ireland exists since the partition of Ireland as an independent country in 1922. But of course British history has much deeper roots. The Anglo-Saxon Kingdom of England was unified in the 10th century and the Kingdom of Scotland was already established by the Picts in the 9th. The British Isles were raided, invaded, occupied and settled from the mainland frequently in the early middle ages. But since the invasion of William the Conqueror in 1066 the British Isles did not suffer further foreign occupation. Still it took a long time for the country to unify. The English kings successfully incorporated Wales in the English kingdom, but Scotland and Ireland remained independent kingdoms, even when all three crowns fell to James VI, King of Scots in 1603. The seventeenth century then saw the English Civil War (1642-1651) and the Glorious Revolution (1688), where the United Kingdom was even briefly a republic under the name of the Commonwealth of England, Scotland and Ireland. The Monarchy was restored, but under the Bill of Rights and Claim of Right Act, was reduced from an absolute to a constitutional monarchy. With the Acts of Union of 1707 England, Wales and Scotland formed the United Kingdom of Great Britain and with the Acts of Union of 1800 the Kingdom of Ireland joined.

It was also in the seventeenth century that the United Kingdom started to rise as a naval superpower and built up a colonial empire that spanned the globe. The first British Empire (1583-1783) started out with privateering in the Caribbean but quickly wars with the Dutch, French and Spanish were fought over dominion in the new world. This era established Britain as a global power and ended with the loss of the Thirteen Colonies in the American Revolution. The second Empire (1783-1815) saw the exploration of the Pacific and the rise and fall of Napoleon. The defeat of the latter at Waterloo left Britain without serious challengers and ushered in the *Pax Britannica* during which the United Kingdom was the unrivalled global superpower until the Great War of 1914-1918. In this *imperial century* the British Empire vastly expanded into Africa, India and Asia. Through its dominance in global trade and finance, the United Kingdom effectively ruled the world, while at home the Industrial Revolution turned the UK into the workshop and London into the financial capital of the world.

With the unification of Germany, the opening up of Japan and the end of the civil war in the United States, however, new rivals to the UK's dominance were arising towards the end of the nineteenth century. The United Kingdom saw itself forced to abandon its foreign policy of "splendid isolation" and ally itself with old enemies France and Russia to be able to maintain the Empire. With the defeat of Germany and its allies in the Great War, the British Empire saw its last territorial expansion which reached its peak in 1921. The Great War, however, had weakened the UK and boosted the confidence of colonial subjects and elites that one after the other asserted their position. Independence movements in India and Ireland and later the rest of the Empire ushered in a gradual decline, while Britain's rivals rapidly industrialised and caught up militarily and economically.

In World War II the UK and her allies defeated Nazi Germany and Imperial Japan, but its days of unrivalled global dominance were over. The Suez-crisis of 1956 made painfully clear that the UK was no longer the military superpower it once was, and large parts of the Empire vied for and gained or were given their independence. The UK had to reposition itself in the new world order. The UK first aligned itself closely with the US during the cold war and after the collapse of the Soviet Union in the US led Gulf and Iraq wars, but it now positions herself more independently towards the Commonwealth, the European Union, NATO and the United States. From this more independent role the UK will continue to play a central role in international diplomacy.

Against the backdrop of her rich and glorious history, Britain developed the many institutions that currently make up its entrepreneurial ecosystem. In what follows we zoom in on its institutions for knowledge creation and diffusion, its financial institutions and its labour markets. We then turn to an overview of recent policy programs and initiatives to support entrepreneurship.

1.2 Knowledge institutions

The UK has a long history of higher education, beginning in the city of Oxford from the year 1096 (University of Oxford n.d.), and followed a century later by Cambridge in 1209 (University of Cambridge n.d.). In the 15th century St Andrews, Glasgow, and Aberdeen – the first three Scottish universities – were founded by papal bull, and a century later the university of Edinburgh was established in 1583 by royal charter (University of Edinburgh n.d.). These six universities are classified as the *ancient universities* (established before 1800) with the classification sometimes stretched to include Durham University.² A key distinction between these medieval institutions of education appears to be the role of social mobility and religion in the admissions process, Scottish universities were much more open in contrast to Oxbridge, which both required students to conform to the Church of England faith in order to receive a degree (Bischof, 2016).

In the 19th century a major expansion of higher education occurred in the UK, St. David's College, Lampeter (Wales), and the various colleges of the University of London³ were awarded university status by royal charter (British Council n.d.). The University of London was established as a secular alternative to Oxford and Cambridge, explicitly excluding religious qualification as an entry requirement, prompting the nickname "the People's University" in 1858 by Charles Dickens' magazine (University of London n.d.). This became part of a greater mass movement towards a more accessible education system, culminating in the founding of what would become the civic universities ('redbricks') in Manchester, Leeds, Liverpool, Sheffield, Birmingham and other industrial Victorian cities. This followed from a growing need for a more localised higher education system (Barnes, 1996) and a desire to increase education of the applied sciences (Heyck, 2012). Simultaneously, the ancient universities of Oxford and Cambridge were reformed away from their traditional seminary and elitist structure, introducing new curricula and relaxing admissions requirements (Scott, 2014a).

Changing attitudes towards higher education since the 19th century can be seen to reflect the wider socio-economic changes which have occurred in the UK following the industrial era. Technological innovation, cheaper transportation and the emergence of the knowledge economy propelled education and training into the spotlight of economic policy making (Clarke, 2001; Ashton

² See Bathmaker et al, 2016.

³ King's College London and University College London.

and Green, 1996). While Scottish universities had historically lower tuition fees and living expenses, English universities before the 20th century remained accessible only to the wealthy as a result of the laissez-faire principles of Victorian Britain (Anderson, 2016). This paradigm radically changed following the infamous Robbins Report of 1963.⁴ It specified 178 recommendations for the higher education system focusing on greatly expanding the number of students in tertiary education (Moser, 1988). One year prior to the report the 1962 Education Act had already introduced state funding for full-time higher education (domestic) students in order to equalise educational opportunity and bring free education to the masses (Wilson, 1997).

The 1960's also saw the establishment of The Polytechnics (Henkel & Kogan, 1993). Following Anthony Crosland's 1965 speech advocating the establishment of two parallel systems of higher education (Taylor, 2003), these Polytechnic institutions arose through the merger of colleges of technology, commerce and art (later including colleges of education) and were committed to the 'application of knowledge'. This offered an alternative form of education to that of traditional universities by overcoming the traditional dichotomy between *theory* and *practice* (Brosan, 1972). Students could therefore choose between these two types of institutions, creating what is now referred to as the *binary divide* in UK higher education, lasting for over a quarter of a century (Pratt, 1997). The essential difference between the two educational systems being that Polytechnics continued to be controlled, as they had been as prior colleges, by local education authorities, as opposed to the greater autonomy which their older siblings enjoyed (Scott, 2014b). In 1992, the binary divide ended and the 'new' polytechnics alongside certain colleges became universities (Cranfield & Taylor, 2008).

In 1985 universities were finally given the rights to exploit their own innovations, which led to the spreading of science parks around universities in the UK. By 1993, almost every university in the UK had its own science park which provided a business environment for almost 1,200 firms and 20,000 employees (Storey & Tether, 1998). However, the presence of entrepreneurship 'in the classroom' is a more recent phenomenon and as recently as the 1990's only a handful of higher education institutes provided serious opportunity for enterprise/entrepreneurial education (Hannon, 2005). Responding to the Lambert Review of Business-University Collaboration, the government announced the Science and Innovation Investment Framework in 2004, cementing business-university collaboration within the portfolio of UK universities (Wilson, 2012).

1.3 Intellectual property rights

The Early Period

Patents and the more general existence of intellectual property rights have been around for centuries in the UK, the key goal being to both protect the property of inventors and entrepreneurs while promoting innovation within a society. Yet any such system requires a certain level of balance to

⁴ Lord Robbins was both an economist and great public figure at the time. He accepted the task of chairing the enquiry into higher education while simultaneously working on a major book in economics, justifying his decision because "yet another work on general economics had less potentiality of ultimate usefulness than an attempt to tackle what I had to recognise to be one of the most important political and social problems of the day..." (Moser, 1988, p. 5).

ensure the social benefits brought about by innovation are not offset by the costs incurred due to the granting of monopoly privileges (Moir, 2008).

In the British context, patents originated in the form of “letters patent” during Elizabethan England. These were essentially royal privileges granting monopoly power to the introducers of new techniques (WIPO, n.d.a). However, this system came to be abused by the monarchy whose royal favours were perceived as privileges granting selective monopolies. Consequently, judicial pressure and public outcry forced intellectual property to be regulated under common law. The Statute of Monopolies enacted in 1623 made all monopolies illegal except for those “*made of the sole working or making of any manner of new manufactures within this Realm to the true and first inventor*” (Statute of Monopolies, 1623). While this was by no means the first form of patent protection for inventors, it is historically important for instilling the principle that only “the true and first inventor” owns the rights to a monopoly patent (Machlup and Penrose, 1950).

The patent system established in 1623 remained to be used for another two centuries and evolved through the work of lawyers and judges in courts without government regulation (IPO Archive n.d.a). This initial laissez-faire approach to patent law meant no examination was required to acquire an English patent, only registration. In contrast, e.g. the French patent system required a full bureaucratic examination of the invention before being passed (MacLeod, 1991). Then, in 1710 the statute of Anne was implemented and is often referred to as the origin of copyright law through the concept of an author being the owner of the copyright. And only in 1711 did the first use of specifications in the patent application process begin to appear in England (Davies, 1934). Moreover, the foundation of property rights for authors of literature had a broader social focus of the continued production of useful literature and the spread of education (Deazley, 2006). The establishment of intellectual property rights was a fitting precursor to the first industrial revolution in Great Britain.

The Industrial Revolution and Invention

The industrial revolution of the 18th and 19th centuries originated in Britain and saw huge technological change and innovation across the country. Yet counterintuitively, the British patent system during this time actually provided weak and erratic protection to inventors (MacLeod, 1988). Compared to countries such as France and the United States; patent application in Britain was burdened with excessive transaction costs and a general prejudice against patentees by judges (Dutton, 1984). Moreover, the extreme laissez-faire approach to patents meant a lack of attention to commercialisation, while other states employed various policies of either compulsion or assistance to incentivise the inventor to diffuse their invention, the British state employed neither (MacLeod, 1991).

By the mid 18th century patentees had growing criticisms with the patent system for being overly costly, as well as it being almost impossible to specify an invention in any such way that would satisfy the courts (Robinson, 1972).⁵ Despite these limitations, the full specification of patents did act to sufficiently inform the public of the invention so that further innovation could more easily occur after the patent reached its term (Mokyr, 2005). Consequently, the significance of the British patent system on innovation prior to its eventual reform in the Patent Law Amendment Act of 1852 remains debated (MacLeod and Nuvolari, 2006). We can conclude at any rate that in this period innovation and industrialisation were not held back by limited intellectual property protection.

In essence, the reform of 1852 made two main changes to the prior patent system. Firstly, legal fees were greatly reduced increasing the accessibility of patenting, while reducing the potential

⁵ See James Watts patent of the steam engine, but did introduce idea of improving an already original invention.

financial risk of invention. Secondly, the 1852 Act implemented a single patent for the United Kingdom, instead of separate patents for England, Scotland, and Ireland which had been the case prior to 1852 (Dutton, 1984). This unified patent law throughout the kingdom. However, costs were still relatively high and in 1875 holding a patent to the full term in Britain was estimated to be 19 times more expensive than in the US (Lerner, 2002). Thus the subsequent 1883 Patents Act reinforced the intentions of the 1852 act, reducing patent filing fees by 84 percent (Nicholas, 2014).

Modern Patent Law

Patent law in recent times can be mainly derived from the Patent Act of 1902, which introduced the idea of investigating the novelty of an invention before granting a patent, thus requiring patent examiners to construct an extensive archive of prior specifications. By 1907 all recorded patent specifications had been classified, with the first documented patent reaching back to the year 1617 (IPO Archive, n.d.b).⁶ Secondly, the 1977 Patents Act applied more stringent novelty tests to patents, which offers an explanation for the large drop in granted patents during the late 1970's (Nicholas, 2014). The act also ensured the patent system was suitably flexible to accommodate new future technologies, while harmonising patent standards across Europe by dealing with the effects of the European Patent Convention of 1973 and the Patent Co-operation Treaty of 1970 (WIPO, n.d.b). The UK is still signatory to these treaties and will remain so after Brexit, making intellectual property rights in the UK a matter of international negotiations.

1.4 Development of financial institutions in the UK

Banking in the United Kingdom began during the 17th century, the Bank of England was founded by Royal Charter in 1694 and was primarily used to fund the war effort against France (Bank of England n.d).⁷ The Bank of Scotland was established one year later in 1695 following an act made by the Parliament of Scotland providing a legal monopoly on banking (Lloyds Banking Group n.d.). It initially fulfilled a different role to its English counterpart, acting mainly to develop Scotland's business and trade with England and the Low Countries. In 1696, the Bank of Scotland became the first European commercial bank to successfully issue a paper currency (BBC, 2008). When its legal monopoly ended in 1716, the Royal Bank of Scotland was chartered in 1727, creating a historic rivalry between the two Scottish banks (White, 1992). The Bank of Scotland's monopoly ended much earlier than the Bank of England's. Scotland then enjoyed a significant expansion in banking services and by the end of the century had one of the most developed banking sectors in Europe (Collins, 2012). The Royal Bank of Scotland even invented the overdraft (BBC, 2009).⁸

From 1709 onwards the Bank of England was the only bank allowed to operate on a joint-stock basis (Ferguson, 2009) and only in the 19th century it lost this legal monopoly on joint-stock banking (Collins, 2012). The next big leap in the history of UK banking was the Bank Charter Act of 1844 (Bank of England n.d.), which restricted the issuance of bank notes solely to the Bank of England.

⁶ Patent No. 1 of 1617 granted to Rathburn & Burges for "Engraving and Printing Maps, Plans &c".

⁷ The nine years' war was a conflict beginning in 1688 between Louis XIV of France and a European coalition including England.

⁸ The bank allowed William Hog, a merchant, to take £1,000 - the equivalent of £63,664 today - more out of his account than he had in it.

From the 1860's, English banking began to acquire a new character, one that it would later be synonymous with – corporate branch deposit banking (Newton & Cottrell, 1998). With restrictions on joint-stock banking lifted by 1858 a few large commercial banks such as Lloyds (1884) and Barclays (1896) began to emerge and on the eve of the first world war residents' deposits in British banks totalled almost £1.2 billion, with a total bank-note circulation of only £45.5 million (Ferguson, 2009). By the 1900's the number of banks had drastically declined as banks sought scale through acquisition, while the volume of deposits rapidly increased, meaning a larger amount of banking activity was occurring by far fewer institutions (Davies et al., 2010). UK SME finance was left predominantly to the big four modern banks - Barclays PLC, HSBC Holdings PLC, Lloyds Banking Group PLC and Royal Bank of Scotland Group PLC – who still hold 78 percent of the SME market and 95 percent in the case of Scotland (Han et al., 2012).

In 1945, the Industrial and Commercial Finance Corporation (ICFC) was created (3i Group, n.d.) via a political decision to increase funding availability for SME's in response to the 1931 Macmillan Committee report, which recognised that no “readily accessible channel, corresponding to the new issue market for larger firms, through which the small industrialist can raise long term funds” (Radcliffe Committee on the Working of the Monetary System cited in Merlin-Jones, 2010, p.5). This initiative was justified by the fact that larger banks and the London Stock exchange mainly focused on overseas commerce, a much more lucrative business than raising long-term capital for SME's (Merlin-Jones, 2010).

Two of the more recent government venture capital schemes were the National Research Development Corporation (NRDC) founded in 1948, and the National Enterprise Board conceived by the Labour government in 1973. Both schemes acted to provide loans to small firms, in conjunction with the private sector, to improve R&D and bolster new innovation (Rothwell, 1985).

The inauguration of the Thatcher government in the 1980's brought about new changes within the financial sector dedicated to fostering a new British 'enterprise' culture. These changes included the reduction of corporate and personal taxes to encourage greater entrepreneurship, alongside the new Business Expansion Scheme which offered up to £40,000 in tax relief to individuals investing in non-public UK companies (Mason & Harrison, 1989). These programs and the most recent initiatives in this area will be discussed below.

1.5 Labour institutions

Wage Setting Institutions

The UK wage setting institutions go back far in history and formed out of conflict between the aristocracy of England and skilled labourers. One of the earliest pieces of legislation, which came about after the breakout of the *black death*, was the “Ordinance of Labourers” legislation of 1349 that implemented a series of labour regulations and price controls to mitigate the problems of labour shortage after the plague (Craig, 2007). Building on this legislation, the Elizabethan Statute of Artificers of 1563 prohibited conspiracies to raise wages and the first worker's associations formed in response to the legislation (Woodward, 1980).

In 1823 the Masters and Servants Act essentially codified previous statutes and allowed magistrates to enact criminal punishment on labourers who broke the terms of their contract (Woods, 1982). Prior to the act unions in Britain had effectively been repressed by the aristocracy and large

employers (Curthoys, 2004). By 1824, unions became partly legalised due to the repeal of the combination laws (Shawl, 1954).⁹ But it was not until the repeal of the Masters and Servants Act (1867) and the Trade Union Act (1871) that there was a positive step towards establishing harmonious relations between the unions and the courts (Kahn-Freund, 1944).

The relationship between employers and the employed during the 19th century remained one of conflict, where the interests of both parties were at odds. This is exemplified in the years immediately prior to the first world war, where core British industries succumbed to large industrial unrest and prompted the government to appoint the Whitley Committee to tackle the issue (British Medical Journal, 1945). The proposals set forth by the committee led to the establishment of the country's first Joint Industrial Council in 1918 (Clegg et al., 1985). With the aim of granting labour a degree of co-management by opening up a wide range of issues to labour-management consultations. But this was short lived and following the deterioration of labourers' power due to post-war unemployment, the state abandoned its support for co-management and consultation (Lewchuk, 1984).

The mid 1970's saw the turmoil of UK recession as a result of the oil crisis in 1973 and also the decline of traditional British industries.¹⁰ This led to turmoil in the country that culminated in the winter of 78-79 (Winter of Discontent – the coldest winter for 16 years), where 1.5 million public sector workers took part in Britain's largest single day of industrial action since the general strike of 1926 (Hay, 2010). In 1980, Thatcher's government then drastically reduced the power of the unions by abolishing the statutory procedure that allowed independent trade unions to seek official recognition. This meant that British employers were no longer legally required to recognise or bargain with the unions (Towers, 1989). Thus, the 1980's and 1990's saw a dramatic decline in trade union power and a decentralisation of collective bargaining (Wooden & Sloan, 1998).

In 1999, the New Labour government under Tony Blair passed the National Minimum Wage Regulations which set a minimum wage of £3.00 per hour for 18-21 year olds and £3.60 per hour for anyone older. The wage floor is a powerful tool for improving the material conditions of labour market 'outsiders', such as those employed in small businesses (Morris et al., 2005). On the hand, the minimum wage also increases the operating costs of firms, which can easily take up a large percentage of revenue in the case of smaller firms (Rusly et al., 2017).

Social Security

The earliest underpinnings of a modern welfare state in the UK can also be traced back to the 16th and 17th centuries with the Act for the Relief of the Poor in 1597 and the Poor Relief Act of 1601, otherwise known as the Elizabethan Poor Laws (Birtles, 1999). These acts responded to the growing need to police the poor and set up measures to relieve the impotent, putting the able-bodied to work, and apprenticing poor children (Slack, 1990). In Scotland the public organisation of poor relief was different from that of England, only providing for the 'destitute' and 'disabled', and excluding provisions for the able-bodied (Edsall, 1971). By the 19th century the old poor laws were reformed by the new Poor Law of 1834. It ensured places of work and shelter for the poor through the mass construction of 'workhouses', sometimes referred to as 'prisons for the poor'.¹¹ The system was far

⁹ The combination acts of 1799 and 1800 were the embodiment of parliament's conversion to a Laissez-Faire policy, removing protection of labour conditions up until their repeal in 1824.

¹⁰ Caused by an embargo imposed by Arab oil producers as punishment for America and the west for supporting Israel in the Yom Kippur war against Egypt. (The Guardian, 2011).

¹¹ A reference made by Richard Oastler – Tory radical and advocate for the "anti-poor law" movement.

from perfect (The National Archives n.d.). Poor law policy after 1834 had two main priorities: transferring the surplus population from the country-side to new industrial districts (where opportunity for work was more plentiful), and safe-guarding the wealthier urban population from excessive support costs arising from surges of rural settlers (Englander, 2013). The population explosion in the cities was somewhat mitigated by the large outflow of British labour to foreign lands. And Britain's entrepreneurs could gain by disseminating the new technological innovations of the British industrial revolution to the rest of the empire (Beckert, 2014).

What we know today as the modern welfare state arose after the landslide victory of the Liberal Government in 1906. It introduced the concept of national health and unemployment insurance in the 1911 National Insurance Act (Feld, 2011). The centuries old poor laws were later abolished by the National Assistance Act of 1948, stating in section 1 *'The existing poor law shall cease to have effect'* (Spicker, 2014). The Beveridge Report of 1941 influenced one of the most radical changes in British history by establishing three main principles for post-war policy development: The introduction of family allowances, a National Health Service, and state maintenance of full employment in order to maintain funding for such social provisions (Whiteside, 2014). In 1948 health secretary Aneurin Bevan of the Attlee Labour government launched the National Health Service that is still operating today (NHS n.d.).

By the 1980's the Thatcher Government introduced various measures to shift social security into an enterprise incentivising framework. In order to tackle the rapid growth in welfare bills, which was connected to an aging population, increases in state pension allowances were altered to keep in line with prices and not with earnings if these were rising faster (BBC, 2011). The government also implemented an Enterprise Allowance Scheme, which gave individuals direct transfers of between £40 and £100 per week for their first year of self-employment (Cowling & Mitchell, 1997).

Employment Protection

The rights of employees in early Industrial Britain were lacklustre and almost entirely subject to the whim of the employer, due to the Masters and Servant Act the terms of employment even became part of criminal law, as disobedient workers could be punished by criminal offence (Choi, 2010). Yet by the 20th century, the initial laissez-faire approach to British labour law had slowly diminished alongside various legislation, such as the National Insurance Act (1911) which introduced a levy to ensure people unable to work received benefit, and the advent of a state pension (Old Age Pension Act, 1908).

In 1963, the Contracts of Employment Act had long term significance by acting as a precursor to a series of statutes which in many respects brought the employment relationship into the sphere of positive legislative control (Grunfeld, 1964). The Act introduced statutory protection relating to termination of employment and also the protection of wages (Brown et al., 2000), with subsequent acts addressing race (Race Relations Act, 1965) and gender (Equal Pay Act, 1970) related inequalities.

The more recent legislation in the 2002 Employment Act was implemented by the labour government and has been said to essentially shift the responsibility of enforcement of employment rights to private management-controlled procedures in preference to independent public tribunals (Hepple and Morris, 2002). This represents a modern approach that concentrates on the competitiveness of the employer over the welfare of the individual, yet this limits even access to enforcement procedures in the endeavour to avoid employer costs and save public funds (Hepple, 2002).

In conclusion, the UK labour institutions have always been, but certainly since the Thatcher era are tilted in favour of employers. This creates great labour mobility and flexibility on the one hand, but arguably low employee-employer loyalty and rather militant labour relations on the other. This makes for a labour market in which it is easy to hire and fire workers, but hard to find committed employees that will invest in firms specific human capital and are willing to go the extra mile and make sacrifices for their colleagues or employers. Moreover, in such a constellation the incentives and rewards for accumulating capital are high, whereas the incentives and rewards for accumulating skills are not. In the end, this will entrench wage inequality and may strengthen the dynamics Piketty (2014) described.

1.6 Regional context

Historically, the UK has evolved as a melting pot of differing countries and regions. Distinctions must not only be made between the four cohabitants: England, Scotland, Wales, and Northern Ireland, but also in terms of individual regions. A North-South divide remains prevalent within England reaching back for many centuries due to the economic, administrative and cultural powerhouse that established itself in the London area. While the divide was temporarily mitigated during the 18th and 19th century, when the industrial revolution in northern regions such as Lancashire raised economic prosperity. By 1870 for example nearly one third of all the steam power used in British industry was used by the Lancashire cotton industry (Balderston, 2010). But this did not last and regional unemployment rate disparities between north and south dramatically increased by the 1980's (Taylor & Wren, 1997). Recent data shows almost all of the least well performing cities in England were located in the north, whereas the majority of the best performing cities were located around the London area (Parkinson et al., 2006). As we shall see below, this is also reflected in the regional distribution of its entrepreneurial ecosystem performance.

In the 1980's the concept of economic policy focused upon specific areas or *zones* was implemented by the Thatcher government. These UK Enterprise Zones embodied the new entrepreneurial culture Thatcher fostered during her time in office. The focus of the programme was to incentivise inward investment to areas experiencing severe economic problems (Potter and Moore, 2000). The Regional Development Agencies Act of 1998 then divided England into nine regions, each with its own Regional Development Agency funded by six different government departments, as well as EU funds. However, this only accounted for around 1 per cent of total regional policy expenditures by central government (Richardson, 2011). Within England the majority of decision making relating to competitiveness is made by central government, whilst regional agencies are strongest in areas of economic diversity and innovation. Yet their influence was limited (Parkinson et al. 2006) and the agencies were eventually abolished in 2012.

In terms of enterprise, the UK has historically varied substantially in innovation levels across regions and localities. Therefore, one-size-fit-all approaches have had unexpected outcomes in different regions. Mueller et al. (2008) found that, for Great Britain as a whole, new firm formation had a positive effect on employment growth. Yet this effect was much smaller for Scotland and Wales, and even negative for the lower quartile regions. Other perspectives regarding innovation policy refer to regional history as a crucial reference point to correcting current disparities in innovation levels. Whilst the industrial revolution offered enormous prosperity to the poorer northern regions, the same regions are now struggling with the burden of their own history. Former industrial centres such as

Swansea and Middlesbrough had to re-invent traditionally strong British industries in the wake of globalisation, whereas the currently leading innovative British cities such as Cambridge, Oxford, and Reading all lack such industrial heritage (NESTA, 2008).

1.7 Entrepreneurship policies in the UK since Thatcher

In our analysis of recent policy initiatives in the UK we consider four priorities of public policy – regulation, access to finance, innovation and enterprise culture (based on a framework by Huggins and Williams, 2009).

(De)regulation

Since the 80s, UK governments of all signatures were actively working to make regulation better for businesses, especially SMEs. It started with government's scrutiny of burdens on business, with a goal to find out which regulations could be simplified or abolished. It was reported in 1985 that excessive government requirements were responsible for a net loss of jobs and were a barrier to entrepreneurship. This led to the 1985 and 1986 White Papers "Lifting the Burden" "Building Businesses...Not Barriers" and thus began the deregulation process which continues in the UK even today (Ashmore, 1988).

The labour government of 1997, led by Tony Blair continued efforts to minimise bureaucracy. At the beginning of its term, this government established the *Better Regulation Task Force* which advises the government how to reduce unnecessary burdens of regulation. The Hampton Report of 2005, which highlighted the importance of risk-assessment before enforcing regulation, and the Task Force's report "Less is more: Reducing Burdens, Improving Outcomes" were two pillars of government's long-term regulation simplification program (OECD, 2009). During the third Blair and subsequent Brown governments (2005-2010), no less than 280 simplification measures were implemented. Government also focused on lifting regulation for small firms specifically with the *Think Small First* campaign.

Further steps toward deregulation were made by the following Conservative and Liberal Democrat coalition government. In 2011, it introduced the *Micro-Business Moratorium* – a freeze on new regulation for start-ups and companies with fewer than 10 employees and in 2011 and 2012, the government applied "one-in, one-out" rule for UK business regulation. Since 2013 the rule applied was "one-in, two-out" and in 2016, the Business Secretary introduced "one-in, three-out" rule. Despite these catchy soundbites and ambitious deregulation programs, however, the instrument is losing its steam. The low hanging fruit has been harvested and inevitably there comes a point where further deregulation will do more harm than good. Regulation of business is not a matter of quantity, but rather of quality. And the regulatory framework needs constant updating as the world changes rapidly. More interesting initiatives in recent years are therefore aiming to develop regulation in a more interactive way. So public interest is safeguarded, but in a business friendly way.

In 2011, for example, the online platform for crowdsourcing *Red Tape Challenge (RTC)* started functioning. The idea of the platform was to give an overview of the regulations by sector and to ask businesses, organisations and the public how can these regulations be improved. The platform was active until 2014. During that time government received over 30,000 comments from the public. Not all were of course equally helpful, but many were and the sheer number of responses shows a willingness of firms and the public to actively participate in the regulatory process.

The coalition government also introduced a requirement for “review” and “sunset” clauses in regulations. Such provisions ensure that regulation does not become entrenched and is assessed regularly. Policy-makers are now required to review regulations after five years and determine whether they are still relevant.

The deregulation doctrine is still very much alive. In 2015 the Parliament passed the *Small Business, Enterprise and Employment Act*, which requires the government of the day to publish a *Business Impact Target* with the goal to “provide wider focus for the reduction of regulatory burdens on business..., ensure that there is even greater transparency around the impact of regulation on business, and provide greater incentives for regulators to design and deliver policies that better meet the needs of business.” (GOV UK, 2016). In addition to regulatory burdens, social security burdens for especially small employers were reduced in 2014. The government introduced *Employment Allowance* for all businesses and charities, which entitled them to a £2000 reduction in their employer National Insurance Contributions (NICs) bill each year and increased it in 2016 by another £1000, allowing start-ups and SMEs to employ 4 workers without paying any NICs. The policy has not yet been evaluated on its effects but is expected to incentivise more employment in entrepreneurial ventures.

Where it is clear enough that excessive and complicated business regulation or high social security burdens can be a drag and barrier to a more entrepreneurial society, evidence also shows that some regulation and barriers to entry can be useful in weeding out low value and low growth start-ups (Stenholm et al. 2013). To some extent, successful entrepreneurial venturing is a numbers game, and the more people try, the higher is the probability of success. But not everybody is an entrepreneur and complete deregulation may well encourage unproductive and destructive entrepreneurship to the detriment of the public. And also when it comes to social security and labour protection, some levels of public insurance and legal protection may be important in promoting on-the-job learning and firm specific human capital accumulation. As we will argue below; a delicate balance needs to be struck.

Access to Finance

In the early 1990s government also actively started working on supporting the development of informal venture capital. This was done through tax incentives for business angels. Although there were some schemes before 1990s (namely *Business Start-up Scheme* and *Business Expansion Scheme*), they were found to be ineffective. The *Business Expansion Scheme* (BES), which was implemented in 1983, was replaced in 1993 by the *Enterprise Investment Scheme* (EIS). This scheme provided both front-end and capital gains tax relief on investments made directly in qualifying unquoted companies, strengthening incentives for business angels (Mason et al., 2010, p.47). The scheme has had a rather positive impact. In fact, according to consultations with members of the business angel community as well as in academic research, it is confirmed that tax incentives play a critical -if not the most important- role in stimulating angel investment activity (NESTA and BBAA, 2009; Mason et al., 2010).

With incentives in place, a vibrant angel and venture capital sector could develop. *Business Angel Networks* (BANs) are institutions which effectively bring together business angels. The public sector’s assistance on reducing the operating costs of BANs has also proven to be pivotal in maintaining a vigorous angel market. Both BANs and economic development agencies have also supported capacity building programs, which went on to help entrepreneurs to become investment ready and to raise the competence of investors (Mason et al., 2010, p. 50).

Moreover, the creation of co-investment funds has enabled business angels to close the gaps in the availability of finance as these provide public money to match investments made by private

early stage investors (Mason, 2009, p. 548). In fact, in a recent evaluation of the *Scottish Co-Investment Fund* (Hayton et al., 2008), Angel Groups are highlighted as being the main beneficiary, accounting for 82% of the co-investments (Mason, 2009).

Furthermore, the *Financial Services and Markets Act 2000* (UK Government, 2000) created the opportunity for unquoted firms to raise equity through the *Self-Certification Scheme*, allowing investors to obtain certification without going through an authorised institution (Mason, 2009). The already existing *Financial Services Act* (1986), already gave BANs the right to promote investment opportunities to registered investors if the objective was as vague as “economic development” and the rise and success of the UK business angel market arguably is closely related to the UK authorities “decision” not to over protect potential (angel) investors. Of course this has caused some to lose money and possibly even some under false pretence and disinformation. But it has allowed many more to invest in ventures that brought innovative ideas to the market and tested their viability in the market.

The Coalition government launched different initiatives to incentivise private non-bank lenders to invest in SMEs (UK Government, 2015). To help with financing new businesses, the Coalition government set up the *Business Finance Partnership* to invest £1.2 billion in increasing lending to small and medium-sized businesses from sources other than banks. Moreover, in November 2011, the *Business Angel Co-Investment Fund* was launched. This fund invests with syndicates of business angels in England who are interested in investing in SMEs. Finally, in 2006-7 the *Enterprise Capital Funds* program was launched, providing venture capital investment for early-stage, innovative small and medium-sized businesses with high growth potential. That is, the successive governments in the UK first allowed a private business angel and venture capital market to emerge and then also channelled public funds to SMEs and start-ups through these channels, thereby avoiding the problem of having to pick winners or write extensive protocols to administer subsidies and grants.

Considerable efforts were also made to get banks to lend to SMEs (UK Government, 2015). For example, in 2009, the *Small Firms Loans Guarantee* was replaced by *Enterprise Finance Guarantee* (EFG). This loan guarantee scheme allowed banks and other lenders to offer small businesses, which lack security or a proven track record, a normal, secured commercial loan. In the financial crisis, however, lending to business in general and SMEs in particular slumped in the UK as in the rest of Europe. Therefore, in late 2010 the *Business Finance Taskforce* was set up by the five major banks with coordination of the *British Bankers Association* to set out how banks could repair their relationship with small businesses.

In early 2011, the *Business Finance Taskforce* set up the *Bank Appeals process*, which allowed SMEs with a turnover of less than £25 million to appeal against a banks’ decision to decline them a loan. During the Coalition government term, more than 9,000 businesses had used the process, resulting in £42 millions of further lending. But although this can be considered a success of the appeals process, it also signals that banks in the UK are not very keen on financing SMEs. This is not a specifically British problem as SME lending is perceived to be risky and expensive and treated rather unfavourably in the most recent regulatory initiatives (i.e Basel III). The credit decision is complicated and hard to standardise, whereas tickets are small and risks are high. Only traditional and expensive relationship banking, traditionally rare in the UK, seems to be able to tackle this asymmetric information problem. To accurately price and manage SME risks is expensive and risk-cost-return perspectives look much better in international investment banking, interbank lending, trading securities and securitised mortgage markets.

Incentivising banks to engage more with SMEs therefore seems to go against the current. Nevertheless, in July 2012, with support from the government, the *Bank of England* (BoE) launched *Funding for Lending*, allowing banks and building societies to borrow from the BoE at cheaper than market rates for 4 years. And, in 2014, the *Department for Business, Innovation and Skills* established the *British Business Bank*, managing all government programs that help smaller businesses to access finance. The latter programme seems to have succeeded and it is still running today. However, in Q1 of 2018 the *Funding for Lending* programme was discontinued as it was predestined to, after its extension in 2014 (Pike, 2017). It was discontinued after it was shown to have great detrimental effect on the savings in high-street banks, as interest rates fell by two thirds in January 2017 (Jones, 2018).

In conclusion, tax and other policy initiatives have given formal UK financial markets a great boost in recent decades. The UK has the largest VC and angel investment market in Europe and London is the financial capital of the world still. The flow of finance to SMEs and start-ups, especially in their earliest stages of growth, however, remains limited. High returns and well developed alternatives for investors make investment and lending to these categories of investees, much less interesting. New initiatives and platform based financial intermediation may be a way to fill the funding gap and both equity and lending crowdfunding are growing rapidly in the UK. It is important to regulate these new markets with care, so that the finance gap in the UK can be effectively addressed.

Innovation

Also on innovation policy, the Blair government continued the efforts of previous governments. Following a series of White Papers published since 1998, the government expressed its intention to make the UK a global leader in innovative businesses. It would implement measures to address three challenges. Boosting R&D, translating knowledge into business and building future skills.

At the end of 2004, the government established the *Technology Strategy Board* (TSB) in order to ensure that the technology and innovation priorities of the government reflected business needs. This was done through *Innovation Platforms* – spaces for learning and knowledge exchange which connected different stakeholders to diagnose problems and search for solutions. The explicit aim of these programs was to forge better links between the UK's world leading academic and business research and the business community that seems lagging in commercialising knowledge and innovations. These programs built on successful initiatives in London, Cambridge and Oxford and sought to replicate them across the country. Specifically, the government launched the *Science City Program* in York, Manchester, Newcastle, Birmingham, Nottingham and Bristol to also attract investors to their strong science-based assets.

Also, the Labour government introduced R&D tax credits which were especially targeted at SMEs. A very broad definition of SMEs was generally applied, such that R&D tax relief was awarded to businesses with a workforce smaller than 500 staff members and a turnover of under €100 million, which usually does not qualify as SME size. Due to the complex and decentralised system of business support, it was difficult for SMEs to find what was offered and where to go for help. Therefore, in 2006, the government started the *Business Support Simplification Program*, which intended to reduce the number of support schemes from 3,000 to 100 in 2010 and put all the schemes under a single umbrella program called *Solutions for Business*. However, according to Centre for Cities (2013, p. 3) "interviewees suggested that it simply repackaged and rebranded existing support initiatives into product strands", suggesting its effectiveness was limited.

To promote the translation of knowledge into products and services, in 2001 the Labour government launched the *Small Business Research Initiative* with the aim to increase the demand for

R&D from high-technology SMEs. At the same time, efforts were made to make intellectual property laws better for businesses. Following the *Gowers report*, the *Intellectual Property Office* was concerned about the extent to which SMEs would benefit from better reporting of intangible assets and therefore it began training *Business Link Advisors* on how to educate firms on intangible property management. The *UK Intellectual Property Office* also began to diminish the amount of uncompleted work flowing from the UK to the *European Patent Office* and improved the governance of the *World Intellectual Property Right Organisation*. More concretely, patent rules were re-examined and obtaining a UK trademark was made simpler.

In addition, and as part of previously mentioned *Solutions for Business* program, the *Knowledge-Transfer Partnerships*, helped entrepreneurs access expertise and skills for growth of their business by connecting them with academic institutions. In 2007 the UK Innovation Agency launched as *Innovate UK*. This program mainly was a way to support business-led technology innovation and to help businesses convert ideas into products, technologies and services. The agency was complemented in 2009 by the *UK Innovation Investment Fund* (UKIFF) with the aim of providing a venture capital fund to drive economic growth and create highly skilled jobs through the investment on innovative businesses with significant growth opportunities. The innovative feature of this initiative was that it would provide funds at all business stages with the market scale that could build companies with global reach (CEEDR, 2012).

In its 2010-2015 *Government Policy brief on Research and Development* (GOB UK, 2015) the Government still voiced a growing concern on business-academia collaboration, for which it allocated £3.3 billion in 2011 and intended this sum to grow by 10% over the following period. In order to achieve this, two initiatives were designed: *The Business-University Collaboration* and *The Business-Research Council Collaboration*. Which aimed to bring together university knowledge, technology and skills with businesses that aim for innovative, high growth.

As a different and more information based way to aid innovative SMEs, *Gateway to Research* was launched in 2013. The platform consisted of an online portal on which all UK Research Councils' and *Innovate UK*'s funded research could be easily accessed. In fact, the platform is still operative and provides users with information on more than 690,518 projects.

Furthermore, motivated by the idea of "clusters" and "external economies of scale", *University Enterprise Zones* (UEZs) were launched. There were specific geographical areas where universities and businesses work together to increase local growth and innovation. They started out with funding of £15 million by the UK government in 2014 and it planned to strengthen universities' role as strategic partners in local growth and stimulate development of incubator spaces. Bradford, Bristol, Liverpool and Nottingham won the bids and these pilots ran till 2017 and will be evaluated shortly (UK Government, n.d.).

To ensure that the innovation ambitions would not fail due to a lack of skilled workers. Significant progress has already been made in improving adults' literacy and numeracy since the launch of the *Skills for Life* strategy in 2001 (HM Treasury, 2009). The *National Skills Academy Programme* (NSA) was then launched in 2005 and since has received £34 million in public funds and was subdivided into different, smaller, categorical academies to train specialists. In 2009 the *National Skills Strategy* was published in order to implement the *Leitch Review* (HM Treasury, 2006). Its main aim was to identify the key personal skills necessary to maximise economic growth, productivity and social justice.

This was followed by initiatives, such as *Train to Gain* (TTG), which was a UK-wide support service promoting the acquisition of business skills and was designed to improve the existent

workforce skill deficiencies identified in the *Leitch Review* (HM Treasury, 2006). The service offered skills advice on a wide range of basic skills, leadership and management training. The programme was discontinued in 2010, however, after it was recognised that “it is simply paying for training that would have happened anyway” (Brennan, 2010). Furthermore, according to (BIS, 2011) “there was little improvement in the labour market outcomes of TTG learners following training”. Indeed, John Hayes, the Business Minister of the UK declared to The Telegraph that the programme was “a deadweight cost” and that it would “cease to exist in its current form with its entire budget diverted elsewhere” (Peacock, 2010).

The initiative to follow the *National Skills Strategy* was *Coaching for High Growth* in 2010, which aimed to assist SMEs to work on their potential and achieve accelerated growth. This program was part of the *Solutions for Business* package of publicly-funded support programs offering help for companies to start, grow and succeed.

According to the *HM Treasury Annual Innovation Report* (2009), the government has been committed to increase the teaching of STEM skills (Science, Technology, Engineering and Mathematics) at higher education institutions across the UK. This was tackled by the allocation of resources to research which factors have influenced the career choices of STEM higher education students. In addition, following the recommendations of the *Lambert Review* (HM Treasury, 2003), the UK government began to promote knowledge transfer between universities and businesses by rewarding universities for activities that enhanced collaboration. Also, two important funds were created: the *Higher Education Innovation Fund* to encourage universities to devote more resources to research and the *University Enterprise Capital Fund* to provide crucial early stage funding for university innovation (HM Treasury, 2010). In the IPO Report *Collaborative Research between Business and Universities: The Lambert Toolkit 8 Years On*, it is noted that overall there is evidence that “the Lambert toolkit has been successful in achieving its aims of making negotiations faster, cheaper and easier, and in providing useful information, precedents and support to facilitate these negotiations.” (IPO, 2013, p. 55). However, it is also pointed out that the impact of the review was limited as it was not considered as a first-choice option in many instances.

In short, the British government over the past decades has implemented a lot of initiatives to try and strengthen the collaboration between its world class scientific institutions and its business sector, but to date results have been modest. Perhaps the problem is not in the unwillingness of the institutions and businesses involved, but rather, the absorptive capacity of the employees. New ventures, SMEs and large corporates can penetrate the knowledge filter, but only when their employees are motivated and have the skills to absorb the knowledge that is available to them. We will return to this issue below.

Enterprise Culture

The UK government seems to have encouraged entrepreneurship through awards since rather early times. For example, *The Queen's Awards for Enterprise* are the most prestigious awards for businesses and individuals in the UK. Being awarded since 1965 for industrial excellence, new categories were recently added to also signal appreciation for entrepreneurial and innovative venturing. Awards are now granted in the categories of innovation, innovative trade, sustainable development and promoting opportunity through social mobility.

Tony Blair's first Labour government wanted to reinvigorate enterprise culture in the UK. One of the most important legislations in that respect was the *Enterprise Act* of 2002 that aimed to change the attitude British society had towards bankruptcy. Bankrupts, since the 19th century, were not

allowed to act as company directors, insolvency practitioners, school governors or estate agents without disclosing their status. *Enterprise Act* of 2002 recognised that there are multiple reasons for bankruptcy and that not all of the bankruptcies are the result of misconduct and irresponsibility (Walters, 2005). Consequently, such restrictions were made conditional and bankruptcy law became more forgiving.

At the beginning of 21st century the *Davies Review* (Davies, 2002) argued that the best way to make the culture more entrepreneurial was through the educational system. In 2004, realising that the number of graduate entrepreneurs was still small, the government established the *National Council for Graduate Entrepreneurship*, an organisation with the aim to promote a culture of entrepreneurship within higher education. In an attempt to further create a more positive image of entrepreneurship, the government also launched the initiative *Enterprising Britain*, which since 2005 is an annual competition for the most enterprising place in the UK, for the organisation that best promotes enterprise and for the organisation that best encourages businesses to export. Also in 2005, the Blair government announced that all secondary school pupils would receive at least five days of enterprise activity and committed additional funding to schools for enterprise education. In fact, the funding for enterprise education grew with each subsequent Labour government. Teaching pupils to be entrepreneurial, however, is not the same as teaching them about entrepreneurship. And it is almost certainly insufficient to try and promote an entrepreneurial culture and attitude through separate modules in otherwise highly protocolled curricula.

The Coalition government therefore shifted focus a bit and made considerable efforts to engage with young people, with the aim to foster a more entrepreneurial youth. The primary focus was not on education and entrepreneurial training, but on funding and supporting of non-governmental initiatives: inter alia *Inspiring the future*, where young entrepreneurs are volunteering to go into schools to talk about running their own business; *Enterprise Village* supports teachers to set up and develop a school-based business; and *Premier League Enterprise Academy* model enabled football clubs to develop enterprise in young people, concentrating in deprived areas.

The Coalition government also funded the development of *Student-led Enterprise Societies*, so all the students at universities and colleges could access support. Their main activity was working together with local firms to get loans for student support and launching start-ups. The *Global Entrepreneurship Week* is an annual event to help young people learn about the range of support programs available to entrepreneurs in the UK.

Besides awards, support and events, the UK government encouraged entrepreneurship through *Enterprise Zones*, established since 2012. These *Enterprise Zones* are designated areas across England that provide tax breaks and government support. Since their inception, these *Zones* have spawned 635 businesses and attracted over £2.4 billion in private sector investments. Of course, *New Enterprise Allowance* and *Start-Up Loans*, which were described in detail above, are also helping to spread an entrepreneurial culture among young people. And the recent past is rife with initiatives to improve access to information and counselling. These initiatives are all part of the big umbrella campaign called *Great Business*, under which in January 2012 the government launched the *Business in You Campaign* with the aim to help people understand how they can start and run their own business.

The Coalition government also encouraged people to use *MentorSME* web portal. The portal was started by the *British Bankers' Association* and it connected small businesses with mentoring organisations across the UK. In 2014 and 2015, as a part of government research project, the *Growth Vouchers* program was established. Vouchers of £2,000 were given to small businesses so they could

use it to pay for business advice. To date, however, no robust scientific evaluation of the program has been published.

1.8 The LSE Growth Commission Report (2017)

The LSE Growth Commission has, in light of the results to the referendum of leaving the European Union, published a report on UK's growth prospects. It had done so a few years before, in 2013, and in its new report, in 2017, it not only proposes new recommendations for the challenges ahead, but it also evaluates progress on its previous advice and builds on this in the new recommendations. The remaining challenges since the 2013 report called for investment in skills, infrastructure, and innovation.

The policy recommendations to boost investment in skills have been focused in providing a better human capital in the UK related to schools. This has been proposed through measures such as improved teacher quality (through better training schemes, raising the status of teaching profession and providing rewards in terms of performance) and redistributing funding in favour of disadvantaged schools. However, there have been budgetary cuts in this sector nonetheless. Furthermore, focus has been given to improving the technical and skill-based education systems by proving a better status and developing better content and award schemes – i.e. the *Post-16 Skills Plan*. Some attention has also been paid to education-related infrastructure by raising funds through increased university fees. However, these types of measures have left poor families in a more disadvantaged position, while their lagging levels of skills are what is driving down the skills performance in the UK. Overall, there seems to be *some* progress in the overall performance of these recommendations since 2013.

The aim of the recommendations to enhance infrastructures underlined the importance of creating a new infrastructure institutional architecture. In fact, the National Infrastructure Commission was announced in 2015. It, however, seems to be lacking statutory powers, which poses concerns about its long-term independence. Furthermore, housing prices have risen, which has also caused concern among the population. Nevertheless, the LSE Growth Commission sees the opportunity for the UK to improve infrastructure finance in light of the diminishing regulatory constraints that have come with the UK's exit of the European Union. There seems to be quite some progress regarding the planning of infrastructure, however, in terms of infrastructure finance, it is still uncertain if the UK will take advantage of its new condition.

To increase funding available for SMEs' high growth potential, the Commission has recommended different policies which would increase competition in retail banking and reforming business banks to prioritise small innovative and young firms. In addition, short-termism was remarked as a problem, and government policy seems to lack continuity in terms of policy dedicated to industrial strategy. In fact, since then, the government has introduced a number of measures to stimulate investment and to improve competition – however the UK independent competition regulator has expressed that there are still shortfalls in competition. Furthermore, the *British Business Bank* has expanded though it represents a rather small fraction of the total finance provided by the UK corporate sector and short-termism. Although initially tagged as "concern of the business" by the government, it has been recognised by the new prime minister, who has mentioned possible government involvement in setting executive pay to regulate it. Overall, SME finance seems to have

gone through a lot of progress and in long-termism and financial practices there seems to be *some* progress.

In its 2017 report, however, the Commission remarks that the UK's principal driver of growth has been employment, whereas the type and quality of this employment seems to be questionable because productivity growth is lagging behind developed countries such as Germany (which is 35 percent above the UK) and the US (which is 30 percent above). The Commission also points at the current account deficit, that is significantly larger than of other advanced economies and a shortfall in investment due to policy uncertainty, short-termism and problems to access finance. The Commission notes that, since 2008, household investment has recovered faster than business investment and, furthermore, it seems to be that forms of finance which are more conducive to innovation (business angels, crowdfunding...) are less common in the UK than in, for example, the US. And although immediately after the referendum GDP growth has been stable, the pound depreciated about 15%, there has been higher inflation and lower venture capital funding. In contrast to the challenges identified in the previous report, therefore, the challenges ahead are distinctively characterised by Brexit and the Commission generally calls for *openness* in terms of capital and labour markets and *industrial reliance on financial markets* which are of international character.

In terms of the labour markets and the proposed "inclusive growth", the report highlights the remaining challenges from the 2013 report, most importantly, employment. Connected to employment there is a concern for productivity and wage growth as it remains rather low (it is the lowest in Europe, after Greece). There is a continuous decrease in skills quality in the UK related to the relatively small inclusion of disadvantaged pupils. The Commission notes that from now on it will become a higher concern due to the limits to skill and talent inflow from all around the world with Brexit. In addition to this, there currently is a higher likelihood of being "stuck" in zero-hour and minimum wage contracts, which seems to be connected to the limitations regarding labour mobility and lifelong training.

Finally, the Commission deems financial services a very important source of jobs, tax and export revenues as it accounts for almost half of the UK's services trade surplus. Still, UK businesses do not seem to raise much in capital markets and the domestic market is clearly too small to support the UK financial sector in its current size. The Commission therefore states that the sector could suffer a wide-ranging set of implications of Brexit for employment and growth.

The Commission therefore calls for a focus on openness and maintaining open relationships with partners abroad and recommends the Government prioritise trade with its main large partners (US, EU) and negotiate market access for services, which is where its comparative advantage lays. The UK must keep barriers to movement of capital open, as its export sectors are highly financed through FDI and its business is very engaged in global value chains. To support such efforts the UK must continue good relations in international institutions and preserve its status as talent "magnet" by not limiting the number of foreigners, facilitate visas and through the clarification of immigration rights of those who greatly contribute to the economy. Interestingly, the Commission also calls for a tax and minimum wage system that is neutral with regards to forms of employment – in contrast to the current biasedness towards self-employment – to promote lifelong learning and adaptable skills in light of rapid technological changes. Coupled with a new system of tax breaks for skills investment and well-resourced technical education, this will make British workers more resilient in future labour markets while supplying British entrepreneurs with the much needed skilled labour force.

In the financial sector, The Commission suggests ensuring the links to EU markets and develop a substitute for the financial services "passport" while also diversifying its portfolio by building new

links to emerging markets and enforce existing ones and tapping into to domestic markets by widening SME access to bond markets and boosting equity tax relief schemes for investors in SMEs to also improve the provision of patient capital. If at the same time smart regulation would make the banking market more competitive while supporting the emerging FinTech sector, the private financial markets can be an asset, not a liability for the British economy. To complement the private sector, the government should strengthen the *British Business Bank* and establish a new infrastructure bank, to fill the funding gaps the private market will not fill.

Finally, the Commission challenges the UK's industrial strategy, although it does open up some policy opportunities. The Commission states that the industrial strategy is lagging behind, in light of the fact that two thirds of the workforce is employed in sectors where productivity is below average. Raising productivity in low-productivity, low-pay sectors could have large aggregate effects in the UK economy, and help reduce inequality and promote inclusion. The Commission therefore recommends the government establish a new framework to pursue six key priorities:

- Skill shortages
- Low productivity sectors
- Small firms (less obstacles in terms of taxes and regulations)
- Universities and private sector collaboration
- City-growth policies (support locally)
- Growth, environment and well-being

It is interesting to note that the Commission has more or less followed the approach we advocated in the introduction. It has assessed the strengths and weaknesses of the UK and triangulating historical, data and qualitative information, diagnosed the UK-economy and proposed interventions to strengthen its health. Moreover, many, if not all, of its proposals directly or indirectly touch on entrepreneurship and the functioning of entrepreneurial ecosystems, most notably the flows of labour, capital and knowledge therein. We therefore largely agree with the analysis of the Commission and largely support the proposals the Commission has made. Still, our focus on entrepreneurship and the entrepreneurial ecosystem has led us to identify slightly different bottlenecks and taking a more historical and regionally differentiated approach leads us to focus our interventions on making the UK ecosystem more diversified and inclusive, while de-emphasising the traditional UK strategies of further deregulation.

1.9 Conclusions

In conclusion, the UK has a rich and long history that has shaped its institutions in a unique way. The British have not been invaded successfully from outside since William the Conqueror in 1066 but did see centuries of internal conflict before the country finally unified in the seventeenth and rose to unrivalled global supremacy in the nineteenth century. In the twentieth century, however, its rivals rapidly caught up and the UK still has to find its position in the emerging new world order. Its influence still extends far and wide across the globe and even today it dominates global finance and diplomacy, but the days of the *Pax Britannica* have gone and with Brexit, the UK once more needs to redefine itself. The UK, like any other nation, will have to compete in an increasingly global market place with

innovative and efficient competitors for the favour of consumers across the globe. It (too) needs to boost its entrepreneurial ecosystem to face that competition.

Since the Thatcher years in the 1980s, the UK has followed a path of privatisation and market competition to foster and regain its competitive position in the world, with mixed success. Its financial sector has developed into the most advanced and developed market based financial system in the world. This attracts capital from across the globe and London is the financial capital of the world still. The UK has also developed its distinct Liberalised Market Economy Variety of Capitalism (Hall and Soskice, 2001) with a business friendly regulatory environment, flexible labour markets, well-funded universities and strong protection of intellectual property rights. In such a system, however, the wealth distribution tends to be self-perpetuating as financial wealth accumulates with the wealthy (Piketty, 2014; Van Bavel, 2016) whereas low labour protection reduces incentives to invest and accumulate (firm-specific) human capital.

As a consequence, the UK system is highly efficient and business friendly, but as a flip side to that coin, is less inclusive and long-run oriented. This is reflected in the famous Great Gatsby Curve proposed by Corak (2013), where the UK ranks high on both inequality and intergenerational wage persistence. Policies that consecutive Conservative but also the Coalition and Labour governments have implemented, still tend to be based on the tried and tested UK recipes of further liberalisation and stronger market competition. The most recent LSE Growth Commission (2017) report highlights various weaknesses that are perhaps best addressed with well-conceived collective action. We will argue below that the UK may actually need to start giving more attention to the public and collective infrastructures that the individual entrepreneur also needs to succeed in global markets. A well-educated, loyal labour force and excellent physical, digital and financial infrastructure are beyond the capacity of any single entrepreneur to provide and justify well-designed policy intervention for the collective good. If thereby the UK entrepreneurial ecosystem can become more inclusive, regionally and across income groups and wealth levels, this may turn out to be vital for the long run socio-political sustainability of the UK-model.

Step 2: Data Analysis with GEI and REDI for the UK

2.1 UK's international position

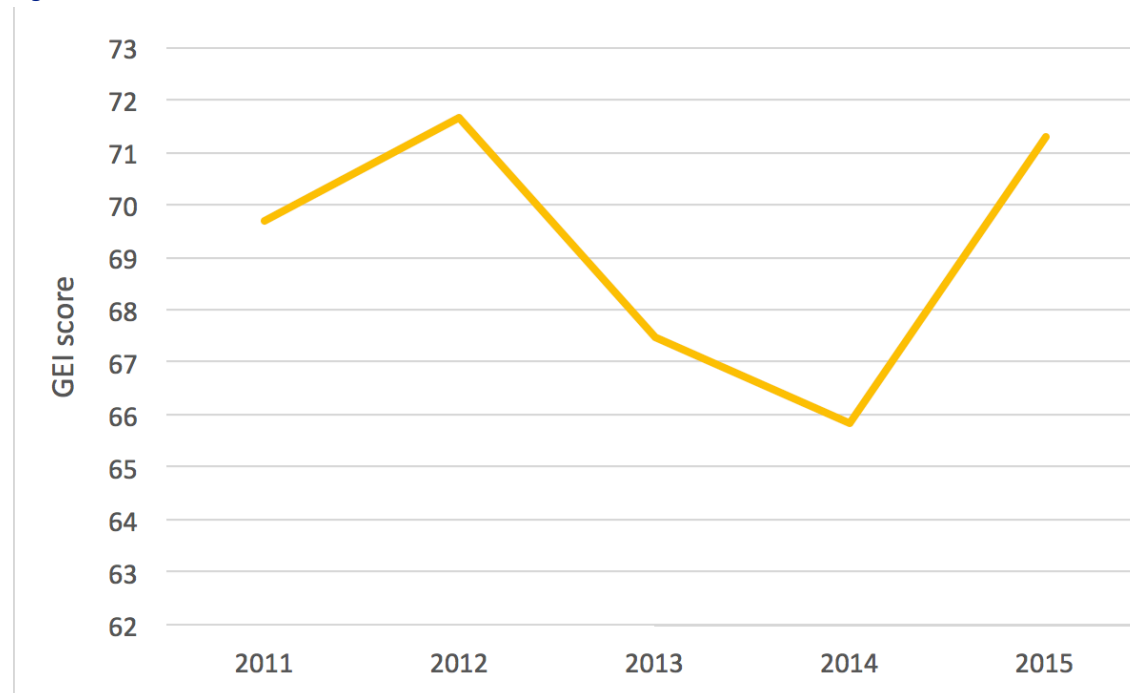
According to Table 2.1, the UK ranks 4th in the Global Entrepreneurship index with 77,8 points. Among the G7 countries the UK ranks 3rd, not that far away behind the US and Canada. It is the best performing G7 European country. When compared with 13 Western European countries the UK is 2nd. The UK's entrepreneurial performance is strong relative to emerging markets. Its score is almost twice that of China (31st) and more than twice of India (48th), Russia (56th) and Brazil (61st).

Table 2.1: GEI Ranking Based on 2016 Data

Rank	Country	GEI	Rank	Country	GEI
1	United States	83,6	34	Colombia	38,2
2	Switzerland	80,4	35	Greece	37,1
3	Canada	79,2	36	Jordan	36,5
4	United Kingdom	77,8	37	Hungary	36,4
5	Australia	75,5	38	Uruguay	35,0
6	Ireland	73,7	39	Croatia	34,0
7	Sweden	73,1	40	South Africa	32,9
8	France	68,5	41	Malaysia	32,7
9	Netherlands	68,1	42	Lebanon	31,5
10	Finland	67,9	43	Belize	30,0
11	Hong Kong	67,3	44	Kazakhstan	29,7
12	Austria	66,0	45	Morocco	29,2
13	Germany	65,9	46	Macedonia	29,1
14	Israel	65,4	47	Peru	28,4
15	Taiwan	59,5	48	India	28,4
16	Chile	58,5	49	Bulgaria	27,8
17	Luxembourg	58,2	50	Panama	27,7
18	Qatar	55,0	51	Thailand	27,4
19	Estonia	54,8	52	Iran	26,8
20	Korea	54,2	53	Mexico	26,4
21	Slovenia	53,8	54	Egypt	25,9
22	United Arab Emirates	51,7	55	Georgia	25,8
23	Poland	50,4	56	Russia	25,2
24	Portugal	48,8	57	Argentina	24,0
25	Cyprus	48,0	58	Jamaica	22,2
26	Spain	45,3	59	Indonesia	21,0
27	Slovakia	44,9	60	Ecuador	20,5
28	Turkey	44,5	61	Brazil	20,3
29	Puerto Rico	42,1	62	Guatemala	18,5
30	Italy	41,4	63	El Salvador	16,7
31	China	41,1	64	Cameroon	15,4
32	Latvia	40,5	65	Burkina Faso	13,2
33	Saudi Arabia	40,2			

The GEI-ranking for the UK is quite consistent with other more commonly used indicators. The UK continues to be in top 10 in terms of “ease of doing business” on the World Bank Doing Business report, although it had fallen from 5th place in 2009-10 to 10th place in 2014. In the 2017-18 report it is in the 7th position, out of 190 economies. This drop-in performance is also clearly visible in the GEI, which dropped from a high of 72 to a low of 66 and recovered to 71 over roughly the same period.

Figure 2.1: UK GEI-index 2011-2015

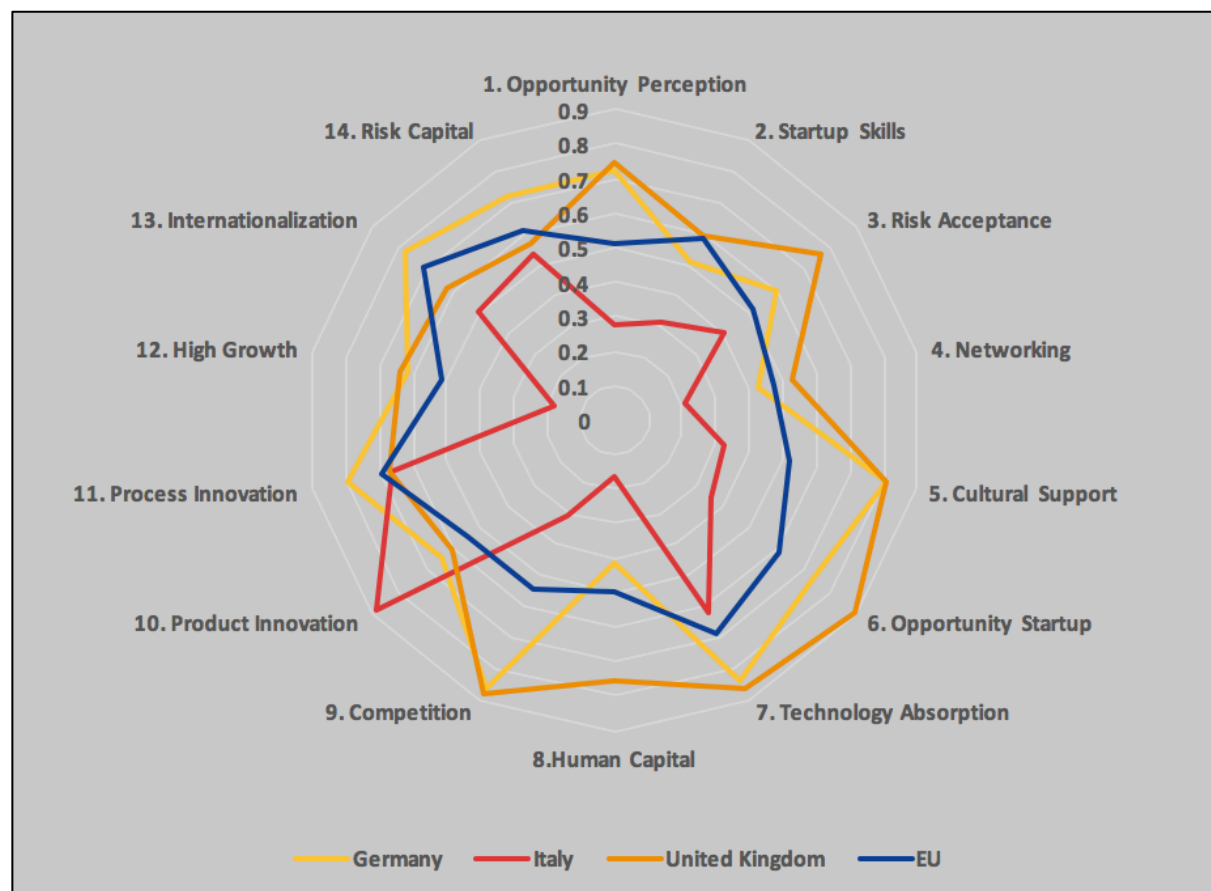


It can be concluded, therefore, that the UK business environment and entrepreneurial ecosystem have not suffered structural damage from the global financial crisis. The World Bank (2018) does highlight the persisting problem of slow and costly contract enforcement. On average, it takes 437 days and costs 45% of claim value to enforce a contract. This ranks the UK 31st in this category (a fall from 24th place ten years ago) with countries like Spain, Croatia, Portugal ahead of it (World Bank, 2018). Despite this issue, however, the UK is 8th on the Global Competitiveness Index (GCI) rankings and ranks high on the quality of its business environment in most rankings (WEF, 2018). The biggest factor in the UK not doing better is the British macroeconomic environment (the UK is ranked 68th by this criterion). The score does not yet reflect the outcome of Brexit negotiations, but it is expected that, as result of it, this will drop even further (WEF, 2018). Interestingly, this mirrors the German case, where a strong and robust macroeconomic environment contrasts with weaknesses in the business environment.

The LSE Growth Commission (2017) identified human capital, especially among low wage employees as a key weakness. Their report suggested levelling the playing field, now tilted in favour of self-employed, to promote long term employment and on-the-job training in the UK. Again, this contrasts specifically with Germany, where permanent contracts enjoy very strong labour protection and on the job training is very strong. Clearly, the UK and Germany have developed different models, as the Varieties of Capitalism literature already suggested. And like in Germany, the strengths of the UK model typically imply its weaknesses. To address the UK’s weaknesses, the LSE Growth Commission (2017) advocates among other things the implementation of a more directive industrial policy to shape future markets and negotiating new trade deals with the EU and US to ensure London’s bank

and services oriented dominance after Brexit. We believe the success of both these policy approaches depends to a large extent on factors beyond UK control and therefore represent high risk strategies. An industrial policy may go horribly wrong if the government bets on the wrong horse(s), whereas favourable trade deals with Trump's "America First" US and Barnier's "first settle accounts" EU are not something to bank the country's future on. How technology will develop in the future and whether London can remain the EU financial services centre, remains uncertain. The only certainty the UK has is that a lot of things will change and it must brace for a major shock. We would argue diversification and flexibility are the best defence against this shock and a more vibrant, agile and flexible entrepreneurial society is able to cope with such uncertainty and change.

Figure 2.2: Radar-plot GEI comparison UK



The UK's entrepreneurial ecosystem, though performing well in international comparison, also has its bottlenecks. The UK for example is known to suffer from the so called European Paradox (EC, 1995). That is, on innovation scoreboards the UK consistently ranks high (Swanen and Wyonch, 2018) and among the Nordics on R&D, science and technology and patenting. But it seems the UK has problems commercialising that knowledge and bringing this new technology to global markets. As the latter is the role Schumpeter (1911) and more recently the knowledge spillover theory of entrepreneurship (Acs et al. 2009; Acs et al. 2013) foresees for entrepreneurs, this suggests there must be weaknesses in the entrepreneurial ecosystem that more traditional indicators and indices fail to identify. In the FIRES-project we proposed and developed the Global Entrepreneurship Index to identify the weaknesses in the entrepreneurial ecosystem. The GEI-index is composed of 14 underlying pillars that together make up 3 sub-indices: Entrepreneurial Attitudes, Abilities and Aspirations (see D4.1 and

D4.2). Figure 2.2 gives us a first glance at how the UK is performing relative to Germany, Italy and the EU average on these 14 pillars.

It is clear from the graph that the UK entrepreneurial ecosystem is strong on almost all pillars and outperforms the Italian ecosystem on all but one pillar, “Product Innovation”. Here the Italian ecosystem benefits from its strong emphasis and specialisation in small scale manufacturing industries, whereas the UK is much more characterised by services, where product innovation is simply harder to observe. The UK also outperforms the EU and Germany on many pillars, especially in the right and lower parts of the graph. There we find the pillars that refer to Entrepreneurial Attitudes (1-5) and Entrepreneurial Ability (6-9).

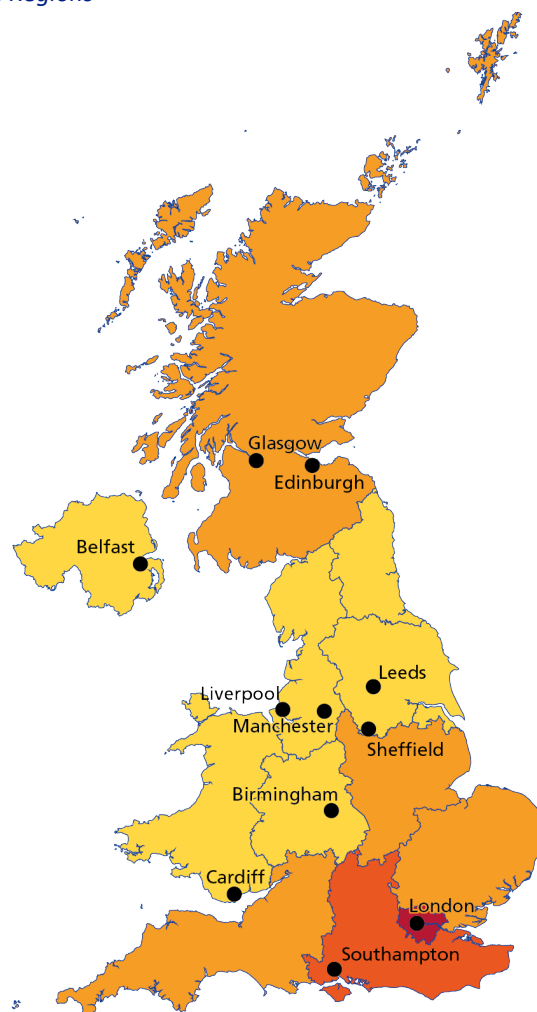
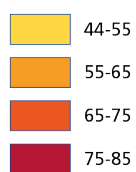
In the upper-left, where Germany and even occasionally the EU as a whole outperforms the UK, are the pillars that refer to Entrepreneurial Aspirations. These include the outcomes and availability of financial and knowledge resources, where it seems the UK ecosystem could benefit from reforms. This confirms the above preliminary analysis that it is the final step from invention to innovation and economic growth where the UK ecosystem has (relative) weaknesses. The data show that the UK performs about at the EU-average and only underperforms the EU average on three pillars: “Process Innovation”, “Internationalisation” and, perhaps surprisingly at first glance, “Risk Capital”. In this low score we see a long-term challenge for UK governments since the early 1970s (HMSO, 1971 and 1979) confirmed. These sources argue that paradoxically, as a result of strong formal financial markets for equity and VC capital, the funding gap for ventures that cannot gain access to these channels and typically rely on informal finance are more pronounced.

The UK is relatively weak in the sub-index Aspirations (upper left pillars 10-14), and very strong in Abilities (lower pillars 6-9). In Attitudes in the upper right side of the radar-plot (pillars 1-5) the UK has a few distinct weaknesses. The underlying algorithm in the GEI-index puts a penalty on bottlenecks in the ecosystem, such that a rounded radar-plot scores higher than a more erratic one and policy interventions should be aimed at alleviating bottlenecks with priority. For the UK it seems that improving the “Startup Skills”, “Networking”, “Product Innovation” and “Risk Capital” pillars are most urgent.

A national level analysis, however, may well hide a lot of regional heterogeneity. Bottlenecks in London may well prove to be very different from the bottlenecks in the West-Midlands and Northern Ireland. So before we draw too strong a conclusion on how to improve the UK entrepreneurial ecosystem, let us first zoom in at the regional level. The regional scores in the UK range from a globally highly competitive 75,5 for London, which after Stockholm and Copenhagen is third among 125 European regions, to scores as low as 44,3 in the North East, at rank 61.¹² These regions compare in Europe to Rheinland-Pfalz in Germany or the Bassin Parisien (the region around Île de France) in France. The map and table illustrate that even at this low spatial resolution, the aggregated REDI-scores capture quite a bit of the regional heterogeneity.

¹² It should be noted that these index numbers are not directly comparable to the GEI-scores above as both the data period and the reference group are different. The latter were obtained in a comparison among 65 countries based on 2016 data, whereas the REDI-scores presented here were computed relative to 125 European NUTS2/3 regions for 2012-2014.

Figure 2.3: REDI map of UK's Regions

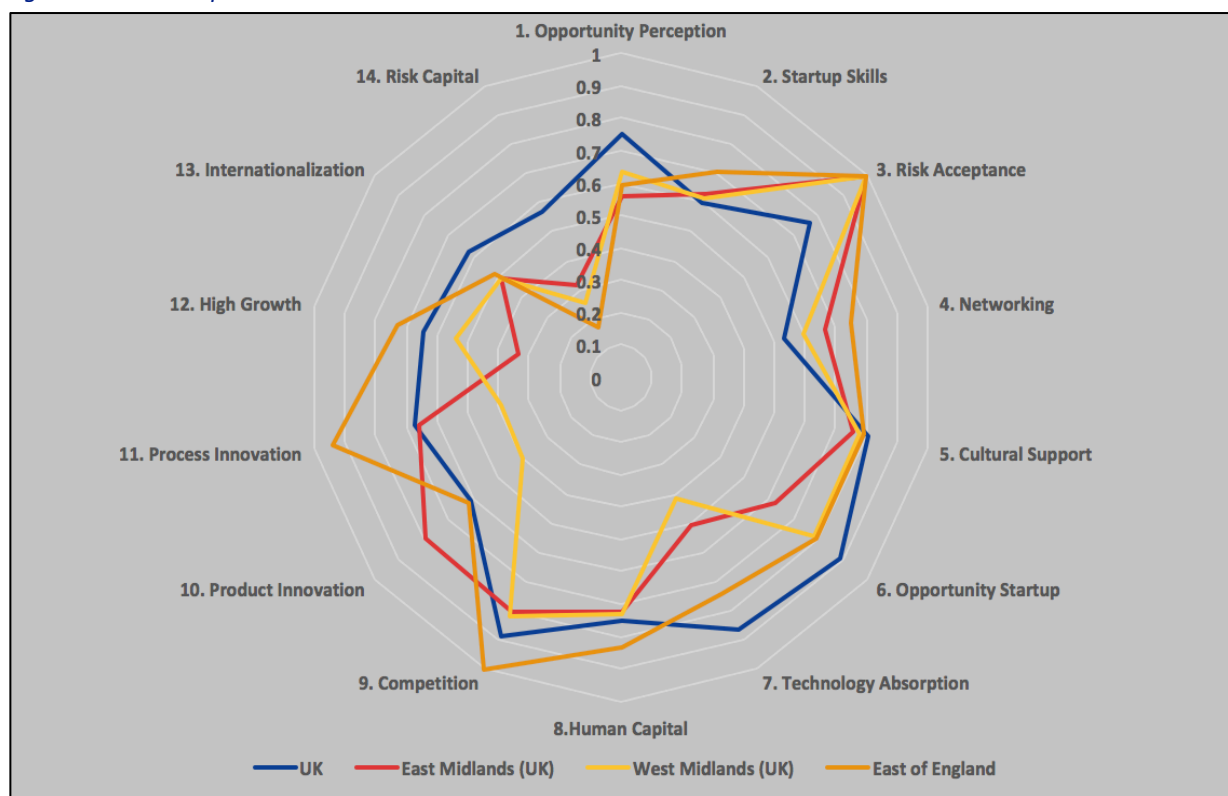


Region	REDI-scores 2011-2014
North East (UK)	44,3
North West (UK)	50,4
Yorkshire and The Humber	51,8
East Midlands (UK)	57,9
West Midlands (UK)	54,0
East of England	58,7
London	75,5
South East (UK)	69,6
South West (UK)	62,3
Wales	50,4
Scotland	60,5
Northern Ireland	55,0

2.2 A more detailed quick scan

A more regional level analysis also seems appropriate as socio-political ramifications of Brexit may well reverse the trend towards more centralised policy making in the UK. Brexit will imply the UK no longer needs strong central representation on behalf of all regions in Brussels, whereas UK regions will now assert themselves more in London. The Brexit vote uncovered important differences across regions, that reflect economic realities as well. Investing in a more resilient entrepreneurial ecosystem that generates inclusive and innovative growth across the Kingdom may well prove an important strategy to prevent further tensions. A first step in assessing the quality of entrepreneurial ecosystems in UK regions is to plot their respective radar plots and compare each region to the UK country scores.¹³ Figures 2.4a to 2.4d show these plots for three regions and the country benchmark. From these plots we can observe that what seems to be a bottleneck in one region, is not necessarily a bottleneck in another.

Figure 2.4a: Radar plot REDI

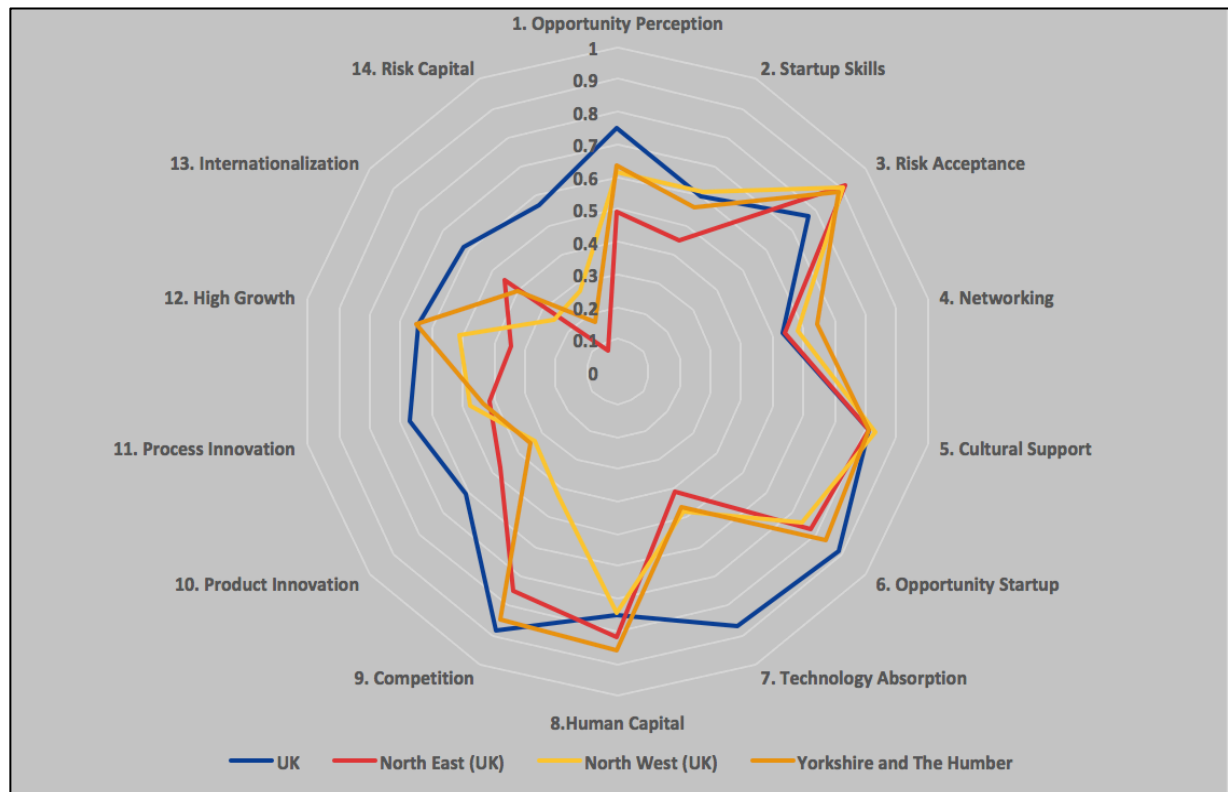


UK regions thus need their own specific approaches and reforms to strengthen the entrepreneurial society in the UK should probably be initiated, managed and coordinated at the regional or even local level. Still, some of the reforms that would benefit some of the regions, do require or benefit from national action. The fact that weaknesses differ by region, does not imply the national conditions for these regions are already optimal. To keep the development of a tailored reform strategy manageable, however, we focus our attention here on three more or less representative regions: London as exemplary of a strong urban ecosystem that competes at the global level, Yorkshire and The Humber

¹³ As indicated in footnote 2, the scores are not directly comparable given they refer to 2016 and are benchmarked against 65 countries.

as representative of the peripheral Northern English regions (Figure 2.4b) and Scotland as representative of the non-English periphery (Figure 2.4d). The full analysis was done for all regions individually, but we report only the main conclusions in Table 2.5 on these regions below.

Figure 2.4b: Radar plot REDI



In Figures 2.4a and 2.4b, what stands out is the low scores on pillar 14, “Risk Capital” for all peripheral regions. “Technology Absorption” is weak in most (but not East England) as is “Startup Skills” and “Product Innovation” and “Process Innovation” (but not East Midlands). The report card for Yorkshire and The Humber in Table 2.2 below, indicates that for that region relatively low scores on “Startup-Skills” are due to low skill perception, whereas the quality of education is not so bad. This may signal that people are not correctly informed about what it takes to become an entrepreneur (which would seem to be corroborated by few people knowing entrepreneurs) but could also signal that those that feel sufficiently equipped, tend to move out of the region.

Such mobility can also explain the low score on skill perception among those that remain. “Technology Absorption” scores are low in most peripheral regions because they score low on both Absorption Capacity and Technology Level. That is, both the environment has low ability to absorb new technology and, as a consequence, ventures have lower technology levels. When it comes to the Product and Process Innovation pillars, the low scores are again due to weak performance on both the institutional and the individual variables underlying these pillars and refer to the general problem of the innovation or “European Paradox”, referred to above. As this weakness characterises more regions in the UK, national level reforms could be useful.

Low scores on “Risk Capital” are typically due to very low levels of informal investment being available and/or accessed in these regions. This could be compensated by strong formal markets for equity in early stage venturing but angel and VC markets have come under criticism for lack of regional, gender and ethnic inclusiveness (Bates and Bradford, 1992; Mollick and Robb, 2016). In Estrin

et al. (2016) the authors investigated the potential for equity crowd funding to play a complementary role in filling the funding gap. But reforms can also be proposed to strengthen the more traditional informal investment channels. This may be particularly important to boost access to informal investment, especially in the periphery.

Table 2.2: Yorkshire and The Humber REDI report card

PILLARS							INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES	
Entrepreneurial Pillars	Attitudes	Opportunity perception	0.64	Market Agglomeration	0.84	Opportunity Recognition	0.72			
		Start-up skills	0.56	Quality of Education	0.76	Skill Perception	0.54			
		Risk Acceptance	0.89	Business Risk	1.00	Risk Perception	0.72			
		Networking	0.65	Social Capital	0.88	Know Entrepreneurs	0.54			
		Cultural support	0.81	Open Society	0.88	Career Status	0.78			
	Entrepreneurial Attitudes 58.3									
	Abilities	Opportunity startup	0.83	Business Environment	0.86	Opportunity Motivation	0.85			
		Technology Absorption	0.46	Absorption Capacity	0.58	Technology Level	0.66			
		Human Capitals	0.86	Education and Training	0.83	Educational Level	0.90			
		Competition	0.85	Business Strategy	0.81	Competitors	0.84			
	Entrepreneurial Abilities 60.2									
	Aspirations	Product innovation	0.35	Technology Transfer	0.77	New Product	0.54			
		Process innovation	0.44	Technology Development	0.57	New Technology	0.64			
		High growth	0.65	Clustering	0.72	Gazelle	0.75			
		Internationalisation	0.40	Connectivity	0.80	Export	0.48			
Financing		0.17	Financial Institutions	0.88	Informal Investment	0.32				
Entrepreneurial Aspirations 36.7										
GEI		51.8	Institutional	0.80	Individual	0.66				

Looking at London (Figure 2.4c and Table 2.3), what stands out is its strong performance on all pillars. London is the entrepreneurial hotbed of the UK and likely attracts talent and resources from the entire country. Entrepreneurial ecosystems typically thrive on clustering and high density and in the liberalised UK markets resources are free to flow and migrate to where the returns are highest. London therefore outperforms all regions in the UK on almost all pillars. But even if London boasts a world class entrepreneurial ecosystem, it too shows bottlenecks in “Product Innovation” and “Process Innovation”, and “Risk Capital”. The first two might in part be explained from the fact that the London ecosystem is highly service oriented. This may lower the scores on product and process innovation without necessarily flagging a big problem or bottleneck. But as was stated above, it is also likely that this reflects a more broadly shared weakness in the UK innovation system that national policies could address.

Figure 2.4c: Radar plot REDI

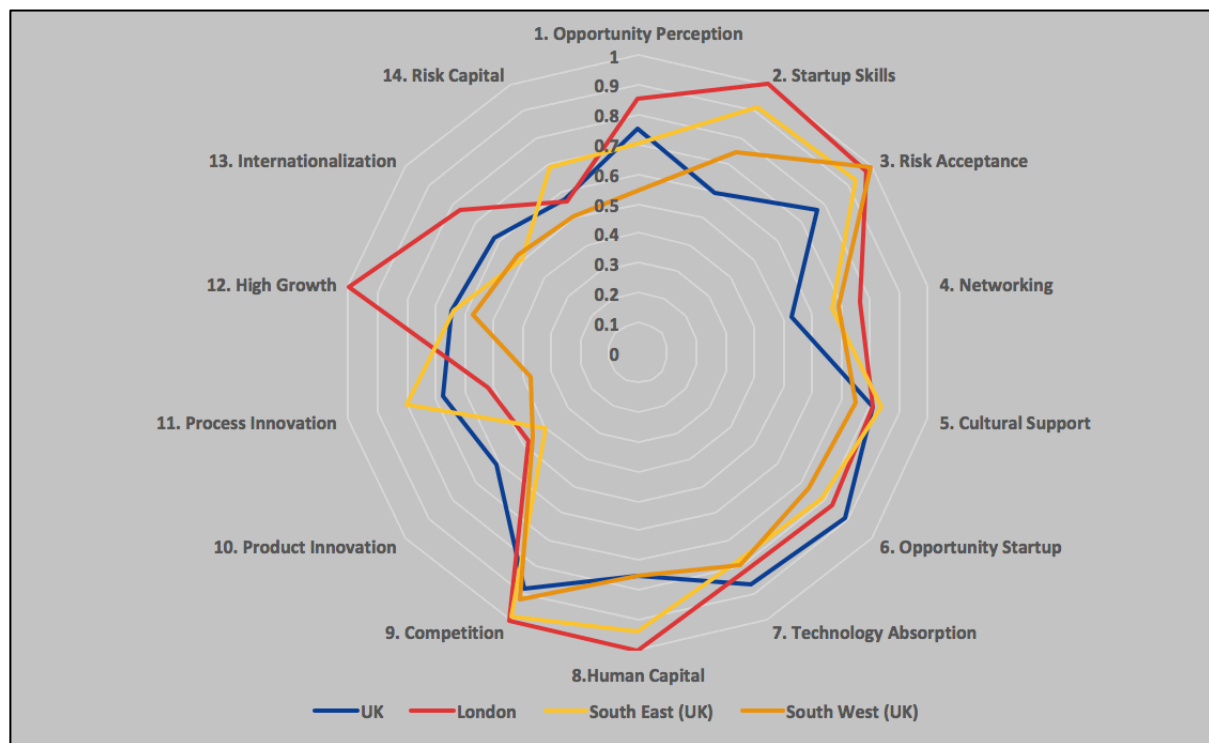


Table 2.3: London REDI report card

PILLARS			INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES	
Entrepreneurial Attitudes	Opportunity perception	0.85	Market Agglomeration	1.00	Opportunity Recognition	0.79
	Start-up skills	1.00	Quality of Education	0.98	Skill Perception	0.75
	Risk Acceptance	0.98	Business Risk	1.00	Risk Perception	0.84
	Networking	0.76	Social Capital	0.92	Know Entrepreneurs	0.66
	Cultural support	0.81	Open Society	0.87	Career Status	0.83
Entrepreneurial Attitudes 80.6						
Entrepreneurial Abilities	Opportunity startup	0.83	Business Environment	0.88	Opportunity Motivation	0.80
	Technology Absorption	0.82	Absorption Capacity	0.95	Technology Level	0.79
	Human Capitals	1.00	Education and Training	1.00	Educational Level	0.84
	Competition	1.00	Business Strategy	1.00	Competitors	0.64
Entrepreneurial Abilities 82.7						
Entrepreneurial Aspirations	Product innovation	0.48	Technology Transfer	0.94	New Product	0.59
	Process innovation	0.52	Technology Development	0.64	New Technology	0.66
	High growth	1.00	Clustering	0.92	Gaselle	0.86
	Internationalisation	0.76	Connectivity	1.00	Export	0.66
	Financing	0.56	Financial Institutions	1.00	Informal Investment	0.56
Entrepreneurial Aspirations 63.3						
GEI		75.5	Institutional	0.93	Individual	0.73

More surprising perhaps is the (relatively) low score on the availability of risk capital, even in the financial capital of the world. As this pillar, however, combines the institutional score on financial institutions (1.00) with the availability of *informal* investment (0.56) to individual entrepreneurs, it reflects the lack of this type of capital only. In London, formal markets for private equity and venture capital are so well developed, that informal investment is hard to come by. This hurts especially those start-ups and SMEs that do not require the amounts a typical deal in VC involves or those that do not want or need the heavy handed involvement of such investors (Fraser et al., 2015). Figure 2.4c shows that the South-East and to a lesser extent South-West, look rather similar to London, implying once more that national level reforms to address these relative bottlenecks are likely to also benefit these regions.

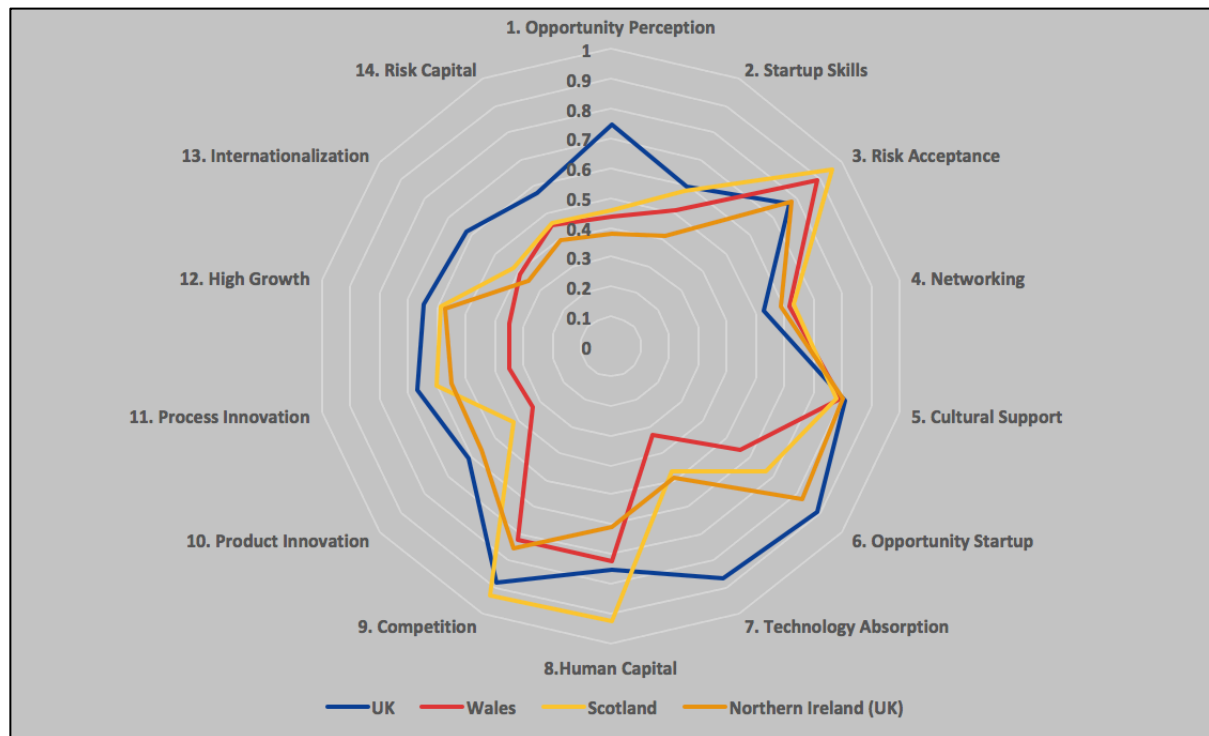
Table 2.4: Scotland REDI report card

PILLARS		INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES		
Entrepreneurial Attitudes	Opportunity perception	0.46	Market Agglomeration	0.56	Opportunity Recognition	0.67
	Start-up skills	0.58	Quality of Education	0.77	Skill Perception	0.56
	Risk Acceptance	0.96	Business Risk	1.00	Risk Perception	0.81
	Networking	0.63	Social Capital	0.88	Know Entrepreneurs	0.53
	Cultural support	0.78	Open Society	0.87	Career Status	0.70
Entrepreneurial Attitudes 63.8						
Entrepreneurial Abilities	Opportunity startup	0.67	Business Environment	0.77	Opportunity Motivation	0.75
	Technology Absorption	0.47	Absorption Capacity	0.71	Technology Level	0.60
	Human Capitals	0.93	Education and Training	0.94	Educational Level	0.83
	Competition	0.93	Business Strategy	0.87	Competitors	0.84
	Entrepreneurial Abilities 68.5					
Entrepreneurial Aspirations	Product innovation	0.41	Technology Transfer	0.93	New Product	0.56
	Process innovation	0.60	Technology Development	0.70	New Technology	0.67
	High growth	0.59	Clustering	0.75	Gaselle	0.70
	Internationalisation	0.42	Connectivity	0.69	Export	0.55
	Financing	0.46	Financial Institutions	0.99	Informal Investment	0.55
Entrepreneurial Aspirations 49.1						
GEI		60.5	Institutional	0.81	Individual	0.67

In Figure 2.4d and Table 2.4 Scotland (and Northern Ireland and Wales) show weaknesses in “Technology Absorption” and generally score low on the pillars in the top-left (Pillars 12-14). Scotland has the strongest ecosystem of the three, but bottlenecks in “Technology Absorption” and “Product Innovation” and to a lesser extent “Opportunity Perception” and “Internationalisation” keep its overall performance down. Underlying these bottlenecks are low scores on both Absorption Capacity and Technology Level for “Technology Absorption”, and on both Market Agglomeration and Opportunity Recognition in “Opportunity Perception”. “Internationalisation” and “Product Innovation” score low because of a (relatively) low export orientation and adoption of new products in Scotland. For Wales the pattern is quite similar, whereas for Northern Ireland, interestingly, the score on “Product Innovation” is low due to a low score on Technology Transfer.

From the three report cards discussed here and those presented in the appendix for the other regions, it is clear that the UK entrepreneurial ecosystems perform well in a European comparison, but if anything, face their most constraining weaknesses in Entrepreneurial Aspirations.

Figure 2.4d: Radar plot REDI



The analysis over all regions in Table 2.5 shows across all UK regions the weakest pillars in the regional ecosystem are all concentrated in the 10-14 range with only a few exceptions. Despite the large range between the best and worst performing entrepreneurial ecosystems in the UK, therefore, it is possible to implement policies and propose reforms that will strengthen all ecosystems alike. The frequent appearance of pillars 7, 10 and 11, suggest a bottleneck in the transfer of knowledge from basic and applied research to commercial activity. The so called “European Paradox”. Absorptive capacity is low in some regions and consequently technology adoption in the form of new products or net technology is limited.

The frequent appearance of pillar 13, underpinned with low scores on exports and sometimes also connectivity, suggests UK manufacturing still has a hard time finding foreign markets and competing in the global market place. The strong services orientation of in particular the London ecosystem, can explain why this aspect of the entrepreneurial ecosystem remains underdeveloped, but although for London this does not seem to be a big problem, for the more peripheral regions in the UK it may well be. Moreover, Brexit may change the competitive position of London as the financial and business services capital of Europe. Diversification and the development of new, more industrially oriented competitive strengths may well be a sensible strategy and require interventions to strengthen these pillars in the UK entrepreneurial ecosystem. This diagnosis stands in somewhat of a contrast to the high scores of UK performance in Science and Technology and Innovation scoreboards (Schwanen and Wyonch, 2018; European Commission, 2017). As these scoreboards usually ignore entrepreneurship and measure the inputs (R&D spending, patents etc.) to innovation, however, this can be explained as a manifestation of the “European Paradox”, where countries leading

in knowledge creation seem to perform much less when it comes to translating that knowledge into viable and profitable new businesses and products.

Table 2.5: Weakest points per region

Region	Weakest Pillars	Weakest Variables
North East (UK)	7, 12, 14	Absorptive Capacity and Technology Level, Clustering and Gazelles, Informal Investment
North West (UK)	10, 13, 14	New Product, Exports, Informal Investment
Yorkshire and the Humber	10, 13, 14	New Product, Exports, Informal Investment
East Midlands (UK)	12, 13, 14	Clustering and Gazelles, Exports, Informal Investment
West Midlands (UK)	10, 11, 14	New Product and Technology Transfer, Technology Development and New Technology, Informal Investment
East of England	10, 13, 14	New Product, Exports, Informal Investment
London	10, 11, 14	New Product, Technology Development and New Technology, Informal Investment
South East (UK)	10, 12, 13	New Product, Gazelles, Exports
South West (UK)	10, 11, 14	New Product, New Technology, Exports
Wales	7, 10, 11	Absorptive Capacity and Technology Level, New Product, Technology Development and New Technology
Scotland	10, 13, 14	New Product, Connectivity and Exports, Informal Investment
Northern Ireland (UK)	1, 13, 14	Opportunity Recognition, Connectivity and Exports, Informal Investment

The pillars in the GEI-REDI reflect the low actual uptake of new product and process technology in new ventures in the UK. This weakness is pronounced throughout the country and even the world class London ecosystem is weak in that respect. This calls for a targeted national approach, where the interventions we propose will aim to strengthen exactly that weak link.

The other pillar that stands out as remarkably and consistently weak across the UK, is pillar 14 “Risk Capital”. This pillar is weak across the board because of low uptake and availability of informal investment while the UK typically scores in the top of the world and Europe when it comes to the quality of its formal financial institutions. We argued above that the strength in formal markets for early stage equity, may have pushed out the important informal sources of capital, leaving more modestly and organically growing SMEs and start-ups bereft of access to equity investment. Well-developed VC and private equity markets are of course good for the unicorns and gazelles that make the headlines, but low informal investment erodes the broad base of more mundane SMEs that provide the vast bulk of (new) jobs and value added and from which gazelles and unicorns may spring.

Financing the SMEs and start-ups at the base requires smaller tickets that promise only lower returns, making them much less interesting for VC funds and angel investors. We believe the UK is doing well in developing crowd funding as an interesting channel to close this funding gap and will propose some reforms to strengthen that development. From table 5 we may conclude that most, if not all, UK regions would benefit from reforms and interventions that increase the technological sophistication and innovativeness of production and increase the flow of funds to perhaps dull, but essential small industrial firms that turn new knowledge into business. In manufacturing this can give

a boost to export performance and global competitiveness, whereas in services this will stimulate the regional and national economy.

We agree with the LSE Growth Commission (2017), that policies to level the playing field between self-employed and employees and increase incentives for on the job training, are helpful in this respect. The UK's strength in labour flexibility may well come at a cost of low loyalty and security for employees that makes investment in firm specific human capital, especially at the lower end of the wage distribution, a less appealing proposition. But before we turn to policy interventions at the national level, the next section will present the results of some counterfactual policy experiments that highlight how improving the underlying institutions would affect the regional distribution of entrepreneurial ecosystem quality.

2.3 A tide lifting all boats or investing in excellence?

Having identified the weakest pillars for the regions, we can simulate what would happen if we could address these weaknesses. Of course, such an exercise has a high counterfactual character and it is far from clear what it would entail to actually change the (situation and then the) scores in reality. But it does bring to the fore an important trade off that policy makers face. In Table 6 we list the regions of the UK and their original REDI-scores in column 3. In column 4 we have increased all regional scores by 10% as a benchmark scenario. By reversing the algorithm, we can then compute by how much what pillars and variables would have to be increased to achieve that 10% increase. Assuming (quite arbitrarily and without claiming any empirical support for this assumption) that increasing a pillar score by one unit of the index is about equally difficult across pillars and variables, we can then compute the minimum required effort (MRE) to achieve this improvement.

By taking this total MRE and reallocating it across regions, we then compute a scenario in which we maximise the country score for the UK in column 5. Interestingly, and in contrast to e.g. Italy, but like for Germany, for the UK as a whole the optimisation would imply a slight redistribution of effort to the lagging regions. This is the result of the fact that the UK's leading regions are already relatively well rounded ecosystems, whereas the lagging regions have a few very important bottlenecks. The overall ecosystem can then be improved most efficiently by addressing these bottlenecks specifically. In column 6 we report the regional REDI-scores when instead the MRE is allocated to maximise the score of the least performing regions up to a common minimum score (here 60.3). This exercise, although one should not attach too much weight to the exact numbers, does reveal an important trade-off that our research has revealed is generally important.

It is clear from the table that what is best for the country is not best for all regions. This is a dilemma that we typically identify at the regional, national (and EU-level). A one-size-fit-all approach is likely to work out differently in different regions and a trade-off is evident when political resources are limited, as they always are. In a globalised economy, where competition implies that only the best can thrive, countries (and regions and cities within regions) do best if they concentrate their efforts and talent to excel. In the UK's free markets, such clustering and concentration indeed takes place at a massive scale, where London and the South-West attract much of the country's talent and resources. Clustering, density and smart specialisation have large benefits in creating sustainable competitive advantages. But as the core-regions join cities and regions on the global frontier, they also tend to pull away from the regions that stay behind. Obviously, a few of the UK's lagging regions risk ending up in that second category as well, although for the UK as a whole there seems little to really worry about.

Table 2.6: Summary Table on new REDI scores after different versions of optimisation

Region Code	Region Name	Original REDI score	Modified REDI score 10% increase	Modified REDI score optimisation	Modified REDI score poorest region
UKC	North East (UK)	44.3	48.7	56.5	60.3
UKD	North West (UK)	50.4	55.4	56.7	60.3
UKE	Yorkshire and the Humber	51.8	56.9	62.5	60.3
UKF	East Midlands (UK)	57.9	63.7	64.3	60.3
UKG	West Midlands (UK)	54.0	59.4	59.4	60.3
UKH	East of England	58.7	64.6	75.4	60.3
UKI	London	75.5	83.1	84.9	75.5
UKJ	South East (UK)	69.6	76.5	78.0	69.6
UKK	South West (UK)	62.3	68.5	67.0	62.3
UKL	Wales	50.4	55.4	51.0	60.3
UKM	Scotland	60.5	66.5	60.5	60.5
UKN	Northern Ireland (UK)	55.0	60.5	56.1	60.3

Policy makers, in the UK elected with a distinctly geographically defined mandate and constituency, must always balance centripetal and centrifugal forces at every level of policy making. This is perhaps even more urgent in the UK, where regions like Scotland, Wales and Northern Ireland have strong regional identities and will assert themselves if they feel left behind. What is true within regions (economic activity and innovation tend to cluster in the cities) is true in countries and the European Union as a whole. Such unequal outcomes, if ignored, may have severe political backlashes and are hard to justify from an equity perspective. We have identified, however, that most regions, although starting at different levels, will benefit from improvements in a limited set of pillars that can be the starting point for a national reform strategy.

For the laggards, mainly in the Northern part of England, a limited number of very clear bottlenecks can additionally be identified and could be addressed at the regional level. At the European level there never was a very strong case for reforms and policies that would benefit especially the already strong UK entrepreneurial ecosystems. Brexit will imply the UK can manage its own affairs and need not consider Europe's periphery. The UK's least performing regions still outcompete much of the European periphery, also on the quality of the entrepreneurial ecosystem as measured by our REDI. But the UK has its own core-periphery to manage. With Brexit the UK national level will be the highest level at which reforms can now be implemented.

We can illustrate the resulting distribution of REDI-scores in the maps in Figures 2.5a to 2.5d. From our counterfactual policy experiments it is clear that what is best for the country as a whole is not necessarily optimal for all regions and choices have to be made. Although the situation improves for all regions in all experiments, the country level optimisation does allow for larger between region differences, leaving in particular, Wales and Northern Ireland, as well as England north of East Anglia, behind. High geographic mobility in the country could ensure that all citizens can benefit, even if not all parts of the Kingdom do so to the same extent. But given low mobility in lower income classes and strong national sentiments in Scotland, Ireland and Wales, strengthening already strong regions may be politically infeasible and a national reform strategy should rather aim to lift all boats on the tide.

Figure 2.5a: Before within country optimisation

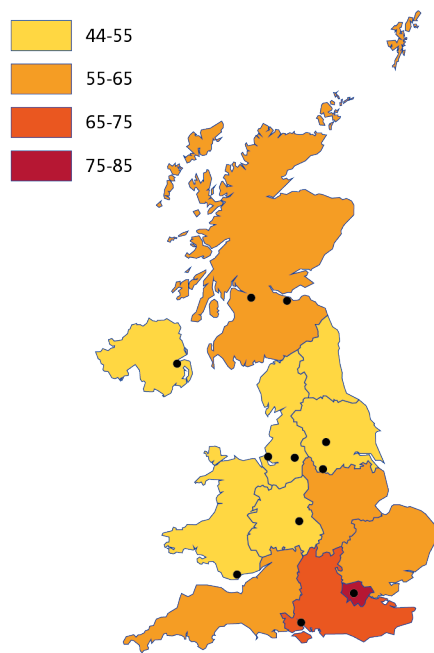


Figure 2.5b: After within country optimisation

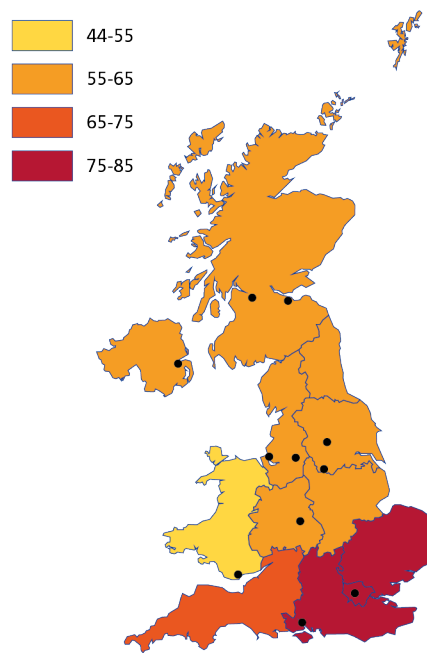


Figure 2.5c: Before poorest region optimisation

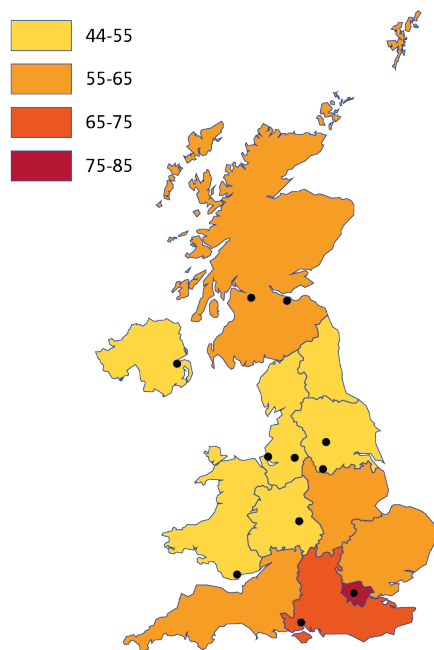
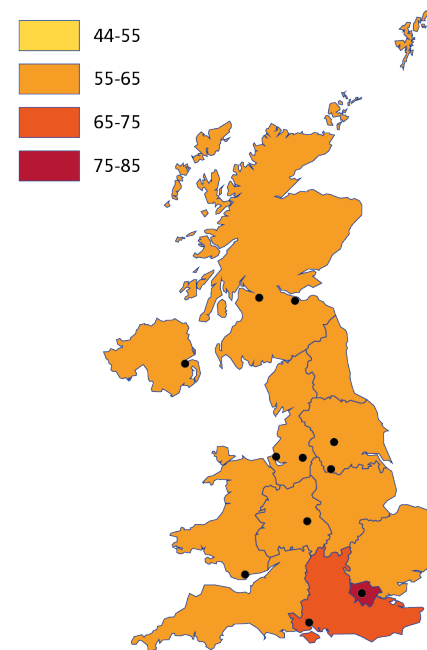


Figure 2.5d: After poorest region optimisation



2.4 Overall conclusions GEI-REDI analysis

Our reading of the data above reveals that in all UK regions and the country as a whole the entrepreneurial ecosystem is strong but bottlenecks remain in a lack of radical innovation (New Products and Technology), export orientation (Exports) and informal investment. It is dangerous, however, to rely exclusively on data and aggregate indices, even if they are composed of a broad set

of sub-indicators. It is always important to complement a data based quick scan with common sense and more qualitative information to contextualise and complete the diagnosis. Only after triangulating the results above with the historical analysis, literature review, expert judgement and more qualitative survey results below, we can map the diagnosis onto our menu of interventions to propose tailored reforms for the UK.

Step 3: Triangulating History, Data and Survey results

3.1 Regulatory barriers to entrepreneurship in the UK

Table 3.1 below shows the results of a survey conducted among 100 founders in 2016-17 in the UK. The results largely confirm but also nuance the impressions from the coarser data based analysis presented in the previous section. The survey elicited a lot more information, specifically about the order of labour, financing and knowledge acquisition decisions in young firms and in the FIRES-project these results were presented in much more detail in D5.1 and the three scientific publications that came out of this work. Here we only briefly show the results of an open question: “Which regulatory requirements did you perceive as major obstacles during venture creation?” that was asked towards the end of the survey.

The first remarkable result in Table 3.1 is that out of 125 answers, some 50 claim there were no regulatory obstacles at all. It is easy to start a business in the UK, as was already clear from the rankings in the World Bank’s (2018) Doing Business reports. A sustained pro-business attitude since the Thatcher years has successfully reduced costs and regulatory barriers to founding and managing businesses. Still some challenges remain. According to a recent poll among business owners (so not only founders), 51% of businesses think that the level of regulation in the UK is an obstacle to success, whereas 46% of small businesses identified tax administration as a burdensome area of compliance (NAO, 2014). This is also confirmed in our survey. Respondents mentioned Data protection laws and more generally onerous information requirements as major obstacles most. The answers to this open question obviously differed from one respondent to the next, but they were coded to compare the answers also across countries. Table 3.1 below reports the number of times the respondents mentioned a coded aspect, but it should be clear that respondents were not prompted to list these topics in the survey. That is, they were free to answer the question in any way they wanted unrestricted by a pre-defined list of options. Coding terms were based on clusters that were identified in the raw data ex post.

On the one hand, the way the question was asked, perhaps led the respondents in a specific direction. In this question, respondents were asked to think about *regulatory requirements* explicitly. This may have led respondents thinking about regulatory obstacles related to documentation, bureaucratic and legal procedures first. On the other hand, however, this question was asked after more general questions about barriers to founding a firm and respondents generally answered this set of questions quite consistently.¹⁴ This suggests that most barriers founders perceive to be important in the UK are of a regulatory nature. That is, they were faced with regulatory requirements that were hard to satisfy.

Percentage-wise, however, none of the regulatory obstacles mentioned really stand out, but this is also to some extent the result of reporting the data in under many clusters. When one goes over the list, legal hassle and inefficient procedures for providing information seem to still leave room

¹⁴ The questions right before this one were: “Which aspects did you experience as particularly important during venture creation?” and “Which aspects did you experience as particularly difficult during venture creation?”.

for improvement. As in most countries, also in the UK it is hard for founders to find and provide the right information and navigate the complexities of government bureaucracy. To some extent this may be an inevitable mismatch between on the one hand the way small, agile and flexible start-up firms are required to operate in the market and on the other, the way governments and government agencies conduct their roles in society. We conclude it is important for government to carefully consider not so much the number of rules and regulations, but rather how founders and business owners can be facilitated in abiding by these rules. Our survey suggests a lot can still be gained in making the rules themselves simpler, more transparent, more stable and consequently easier to understand and follow.

Table 3.1: Results survey regulatory obstacles in the UK

Regulatory Obstacle	Times mentioned
Which regulatory requirements did you perceive as major obstacles during venture creation?	125
None	50
Onerous requirements for documentation	9
Data protection laws	9
Legal Insecurity	6
Legal requirements for approval	6
Tax legislation	6
Difficulties with obtaining government funding	4
Pension scheme	4
Constantly changing regulatory environment	3
Insurance requirements	3
No answer	3
Specific requirements related to energy sector	3
High Taxes	3
Lacking information about running a business	2
Stringent Environmental Regulations	2
Requirement to report same information to different organisations	2
Inflexible Employment Law Regulations	2
Dispersed availability of important information	1
VAT registration	1
Payroll legislation	1
Regulatory obstacles for foreigners	1
Specific requirements related to consulting sector	1
Bank administration	1
Health regulations	1
Regulatory constraints in early phases of venture creation	1

3.2 Founders' suggestions for reforms in the UK

In Table 3.2 below we list, from the same survey, the answers to the question: "What can policy makers do to facilitate venture creation?". The most common suggestions by the founders called for facilities to finance small businesses and policy stability.

Table 3.2: Policy recommendations by founders in the UK

Policy Suggestions	Times mentioned
In your view, what could policy makers do to facilitate venture creation?	88
Facilitate financing for small businesses	9
Avoid constant policy changes	9
Provide better training to people for starting businesses	9
Provide better information about how to start a business	6
Improve situation specific to energy sector	5
Reduce bureaucracy	5
Centralise information for starting business	5
None	4
Remain in EU	4
Reduce tax rates for small businesses	3
No answer	3
Provide incentives for hiring people	3
Improve clarity of employment law	2
Financial benefits for founder	2
Provide guidance	2
Provide subsidies	1
Facilitate bringing product to market	1
Clarify data protection law	1
Positive message about need for renewable energy	1
Enable direct start through temporary tax numbers	1
Do not make venture creation too easy to maintain high quality	1
Improve accessibility of employment regulations	1
Make IR35 more definitive	1
Simplify trademarking process	1
Be less lenient towards incumbents	1
Provide better networking opportunities	1
Simplify legal process	1
Reduce the cost of running business	1
Simplify venture creation process	1
Strengthen start-ups legally in property right disputes	1
Improve situation specific to IT sector	1
Reduce costs of hiring employees	1

Importantly, the founders do not call for further generic deregulation, but for better and more transparent (centralised) information and training. Also in the top-10, but mentioned thrice out of the 88 answers received, is lower taxes and stronger incentives for starting a business and hiring employees. The only specific sector, like in the previous table, that was mentioned explicitly more than once, is the energy sector. Some mentioned specific requirements in that sector as a barrier earlier and when asked what the government could do, respondents stated these situations should be improved. It would be wrong, however, to conclude from these survey results, that regulation in that sector is only a barrier. Entrepreneurs may consider detailed regulations a nuisance, but the energy system is of course one of the most important infrastructures in a modern economy. Making sure all that are active in that sector comply to shared standards and security measures is a matter of common sense. Still such common sense regulation should of course be clear, transparent, stable and unambiguous. And should not block new entrants from shaking up the sector. We therefore interpret the calls for reduced bureaucracy and improving the situation for the energy sector in that way.

UK founders also make several suggestions to improve information availability and accessibility for founders. It seems they have experienced some problems getting the right information at the right time or lacked the training to deal with issues they encountered. A centralised information facility that should provide better information on how to start a venture seems like a quick win to address this barrier. From the responses one could also conclude that such information and training is especially relevant in issues relating to data management and intellectual property rights registration as well as labour and tax legislation.

Recall that the weaknesses the GEI-REDI analysis revealed are a lack of radical innovation, export orientation and informal investment. As we have discussed in section 2, and is somewhat confirmed in the founders' survey, the latter does not seem to be a big problem. A lack of finance was not mentioned as a major barrier and although the provision of financing for SMEs was mentioned as a possible policy, we should realise it is also a very obvious policy to suggest. UK founders also do not seem to recognise a lack of innovativeness or export orientation as problematic. But it is very possible that founders that did start a firm, perceive that venture as quite risky and innovative. And when facing intense domestic competition in a services oriented market, perhaps exports are also a bit further removed from day to day concerns. Consequently, the founders are perhaps not inclined to recognise these more general features of the wider ecosystem.

Indeed, the surveyed founders may find themselves in a vibrant entrepreneurial scene and perceive a strong ecosystem where only regulatory constraints hold venturing back. They could be less informed and aware of the barriers to entrepreneurship in the lagging regions and the macro conditions of the broader ecosystem. It is also a matter of degree. The UK ecosystem as a whole and definitely the regions where one is most likely to find founders, all perform in the top. Barriers and solutions, although real and recognised by the founders in the system, are perhaps less blocking and urgent then elsewhere. In that respect it is good to note that out of 125 answers by 100 founders, 50 of them answered "None" and some 88 went on to make suggestions for policy. These numbers and possibly therefore the frustration with the ecosystem, among e.g. the Italian founders was much higher.

Moreover, with this final question we perhaps guided respondents to think about what active policies the government could undertake. The resulting policies are therefore all action oriented, whereas the FIRES-approach to improving the broader entrepreneurial ecosystem, sometimes justifies more long term perspective and rather indirect measures to improve the overall institutional environment. It is probably better to not take the survey responses too literally and rather interpret

what founders are really signalling when they propose the government provide more guidance, information and training. Where founders signal a lack of information and training and call for a more stable policy environment, we can interpret this as general support for a more fundamental reform approach that creates institutional support for those providing such services and knowledge.

When they call for lower taxation and higher financial benefits for the founder, we should of course be very cautious. Nobody likes to pay taxes, and founders are no exception. The level of taxation and social security contributions out of total profits is estimated to be about 30% (World Bank 2018) in the UK and on “paying taxes” the UK ranks 33 out of 190. In a European comparison, the UK founders pay very little taxation and successful founders are rewarded generously for the risks they take. Still, also in the UK clever tax reforms might shift more financial, labour and knowledge resources into entrepreneurial venturing, even if the overall tax burden is already low.

3.3 Conclusions

In sum, the survey does not fully confirm the weaknesses identified in the data based quick scan. But it provides some interesting additional information. For example, the need to create a stable institutional and legislative framework that is above all transparent and clear. Such information is hard to gather from quantitative data. The survey is extremely useful in complementing the results we obtained from the data and benchmarking exercise in section 2. Notably the lack of informal investment and the weak performance in knowledge commercialisation were not mentioned as barriers to firm formation, although founders do suggest the government improve financing of SMEs specifically.

Also, the founders agree with the LSE Growth Committee (2017) that incentives for employing workers should be strengthened, although it is unclear from the survey if they propose this for the same reasons. The data analysis and survey prove highly complementary in the case of the UK. The data show macro and systemic features that are hard for founders to identify, whereas founders mention, when asked for the most important barriers and possible policies, those they perceived most important in their personal experiences and direct environment. There is valuable information in both. And in isolation both are insufficient as a guide to policy. The true value of this information is revealed when combined with information from other sources. The triangulation of our historical, quantitative and qualitative information for the UK, though necessarily limited in scope and depth, now reveals enough information to now draw up a diagnosis for the UK and turn to a proposed treatment.

Step 4: Mapping onto the FIRES-reform proposals

Formulating a reform strategy to strengthen the entrepreneurial ecosystem is not unlike treating a patient. In the previous sections we have considered the medical history of the patient, used an advanced diagnostic tool to scan for her health problems and asked the patient how she felt and what she believed would be good treatments. Based on all this information we can come to a diagnosis and mapping that diagnosis onto the menu of available treatments, propose a treatment that fits the patient.

For the UK we conclude that its rich and long history has shaped its institutions in a unique way. The British have not been invaded successfully from outside since William the Conqueror in 1066, but did see centuries of internal conflict before the country finally unified in the 17th and rose to unrivalled global supremacy in the 19th century. In the 20th century, however, its rivals rapidly caught up and the UK still has to find its position in the emerging new world order. Its influence still extends far and wide across the globe and even today the UK dominates global finance and diplomacy, but the days of Empire have decidedly gone. The UK, like any other nation, has to compete in an increasingly global market place with innovative and efficient competitors for the favour of consumers across the globe. It (too) needs to boost its entrepreneurial ecosystem to face that competition.

Since the Thatcher years in the 1980s, the UK has followed a path of privatisation and market competition to foster and regain its competitive position in the world, with mixed success. Its financial sector has developed into the most advanced and developed market based financial system in the world. The UK has also developed a distinct liberalised market economy with an extremely business friendly regulatory environment, flexible labour markets, well-funded universities and strong protection of intellectual property rights.

In this system, however, the wealth distribution has become rather self-perpetuating as financial wealth accumulates with the wealthy whereas low labour protection reduces incentives to invest and accumulate (firm-specific) human capital. As a consequence, the UK system is highly efficient and business friendly, but less inclusive and long-run oriented. This is reflected in the Great Gatsby Curve (Corak, 2013) where the UK ranks high on inequality and this inequality is persistent over generations. Policies that consecutive Conservative but also the Coalition and Labour governments have implemented, still tend to be based on the tried and tested UK recipes of further liberalisation and stronger market competition. We argue below that the UK may actually need to start giving more attention to the public and collective infrastructures that the individual entrepreneur also needs to succeed in global markets. Making the UK entrepreneurial ecosystem more inclusive, regionally and across income groups and wealth classes, may well turn out to be vital to the long run socio-political sustainability and global competitiveness of the UK-model (Piketty, 2014; Van Bavel 2017).

The UK boasts a strong entrepreneurial ecosystem in general. But at the regional level, disparities are large. London is the undisputed hotbed of entrepreneurship alongside lagging rural and old industrial regions. The geographic resolution of our data reveals that arguably UK's entrepreneurial talent and resources tend to cluster in London, where returns to such skills and resources are highest. Quantitative data analysis then suggests large heterogeneity in entrepreneurial ecosystem performance, whereas for the country as a whole and the regions affected, this is not necessarily a big problem.

The results from the surveys do not suffer from this problem and confirm that indeed the challenges and bottlenecks in the UK ecosystem are not formidable. Founders suggest regulation makes the founding of new ventures difficult. But the problems do not seem nearly as big as in for example Italy. Importantly, founders in the UK do not complain about a lack of funding, lack of skilled personnel and lack of knowledge.

Our data analysis does reveal, however, that UK entrepreneurship is less successful in adopting and commercialising high tech knowledge developed in the UK academic institutions and world class R&D labs. New ventures in the UK score (comparatively) low in radically new products and technology absorption and its regions lack risk capital in the form of informal investment. These pillars in the ecosystem seem the weakest link in an otherwise well developed and functional entrepreneurial ecosystem in the country as a whole and the individual regions separately. If there is any treatment needed, it is to overcome these weaknesses in the UK system.

If the UK is to leave the European Union and trade agreements with the US and EU are not so easy to reach, then the UK will have to diversify its economy and regain its position in global markets also as a high tech industrial exporter. But whatever the future has in store, a healthy entrepreneurial ecosystem will be an asset and interventions to strengthen technology absorption and informal finance for more mundane and slow growing industrial SMEs and start-ups, will be beneficial. Taking these prescriptions to our menu of policy interventions and reform proposals in Part I of this report, we can select the fifteen most suitable interventions. They are listed in Table 4.1 below.

Table 4.1: FIRES reform proposals for the UK

#	Section	Title	Proposal	Explanation	In the UK
2	3.1.3	Patents and Intellectual Property	Experiment with the right to infringe upon patents that are not actually commercialised.	Of course, the European Union is party to international treaties, such as the WTO TRIPS Agreement, that sets minimum requirements to IPR. We do not propose the European Union violate or disregard these treaties but encourage the Union to use its influence in the governing bodies to get them reformed to accommodate our proposals. These limitations of patent rights would still fall well within the institutional structure in place but would significantly reduce the risk entrepreneurs face of being sued for infringements on patents they did not even know existed (Jaffe and Lerner 2004, 2011).	IP is intended to promote the registration, diffusion and commercial application of new knowledge and technology. But the system is gradually turning into a one where savvy lawyers help large corporates to prevent, not promote these things. To restore the system to its original purpose, the rights of inventors and infringers need to be better balanced. You can be the inventor/discoverer of an idea, but society only benefits if that knowledge is commercialised.
5	3.1.3	Patents and Intellectual Property	Support experiments and pilots currently developed with open source patent registration.	The functions of patenting can perhaps be fulfilled more efficiently in other ways and certainly do not require allowing inventors to monopolise and thereby limit the profitable use of the knowledge they have generated. But given the legal complexities and institutional complementarities we propose a cautious approach of experiments that retain the system's benefits while increasing the free flow of knowledge. Boettlinger and Burke (2004) for example proposed open source patents to retain the functions of knowledge repository and verification, while improving the access to knowledge also for commercial use.	Open source patents combine giving credit to the inventor, keeping a registry of useful knowledge and opening up that knowledge base for further expansion, also through commercial venturing. The UK after Brexit will remain a member of EPO but can offer to take the lead in experiments that will promote free flows of knowledge in society.
11	3.2.6	Taxation of Private Wealth	Reducing taxes on private wealth, private wealth transfers and inheritance.	Kotha and George (2012) show that entrepreneurs distribute ownership rights to informal investors and their investments early in the start-up process, suggesting triple-F financiers are not mere charities. And Burke et al. (2014) show that the supply of triple-F informal entrepreneurial finance typically follows demand closely and that amounts invested are typically in the same order of magnitude as those committed by angel investors discussed below (in the 0000s). That is, entrepreneurs mobilise significant funds from their personal networks and these funds help them develop their venture in its earliest stages. It is possible that more supply of informal finance would thus enable or even cause more entrepreneurial venturing.	This may sound counterintuitive as a policy to promote a more inclusive entrepreneurial society, but small, everyday entrepreneurs cannot access the increasingly formalised angel and VC markets. Their tickets are too small and returns too low to attract such funding. Thus triple-F finance is their only recourse. This proposal aims to increase the availability of such funding. As we want to promote especially small tickets and amounts, the tax reductions can be capped at relatively low amounts. Wealth that is actively invested in small, triple-F, equity investments should be treated differently from large fortunes, passively invested in global financial markets.

#	Section	Title	Proposal	Explanation	In the UK
15	3.3.3	Institutional Investors	Make it (fiscally) attractive to invest private wealth in entrepreneurial ventures.	Wealth-constrained would-be entrepreneurs are unable to credibly signal their project's worth to outside investors by means of making sizeable equity infusions of their own. More private as opposed to institutionalised wealth would lessen the inherent problem caused by such asymmetric information, and, if needed, enable entrepreneurs to fully finance their ventures until organic growth based on retained earnings is possible.	Following up on the proposed above, the low taxation on wealth could be made conditional on how the wealth is invested. The government should of course not get involved in capital allocation directly, but rather promote some over other categories of investments. This, combined with crowd lending and equity platforms, can democratise capitalism (Shiller, 2013; Mollick and Robb, 2016).
18	3.3.4	Banking	In the system of bank loan guarantees for start-ups, ensure that credit decision information is made available.	Such public guarantees can be motivated from the fact that entrepreneurial venturing creates knowledge spillovers and positive externalities that banks and entrepreneurs do not consider in their private decisions. This information, however, should then be disclosed (for example via the proposed Entrepreneurship Observatories in Proposal 45 below).	Banks in the UK do not disclose information about credit they grant or credit they refuse (Barclays, 2017). Such information, if adequately anonymised, however, can be very helpful for other credit seekers and investors, also outside the banking sector. Access to such information should be supervised by the government and privacy must be protected.
27	3.4.2	Inclusive Entrepreneurship	Further develop entrepreneurship programs targeting groups that are disadvantaged in formal employment.	Entrepreneurship is perceived to be inherently more inclusive than employment (Glazer and Moynihan 1970), but the evidence shows (Fairlie 2006, Dilli and Westerhuis 2017) that income and participation gaps largely extend to business ownership and income. To enable disadvantaged groups to engage with the opportunities the Entrepreneurial Society offers, some special attention and support, as already offered in the latest Horizon 2020 program, is justified.	In the UK the probability of being self-employed is higher among migrants and disadvantaged groups. When self-employed they earn less and work longer hours, but also report higher job satisfaction and happiness (Blanchflower and Shadforth, 2007). It is therefore worthwhile to increase participation through promoting self-employment and entrepreneurship among these groups.
31	3.4.3	Employment Protection Legislation	Establish or strengthen training programs to prepare workers for new occupations	Archanskaia et al. (2017) show that countries with a low rate of substitution between inputs in routine production, will not be able to gain a comparative advantage in high-value products that are intensive in non-routine tasks. As a result, they will end up specialising more and more in routine-intensive products and experience lower wage growth. Geurts and Van Biesebroeck (2016) further show that the pattern of firm-growth in Belgium indicates that young firms under-adjust to good news. As a result, many promising firms scale up too slowly and they might miss out on opportunities in a fast-paced global market.	Job creation and destruction are relatively high in the UK. Small firms are disproportionately responsible for this. This implies a more entrepreneurial society, with more employment in small and medium sized firms in experimentation, will imply employees need to be equipped with the skills to transfer jobs and employers. (Hijzen et al., 2008)
43	3.5.4	Digitalisation	Develop open standards and open regulation for digital platforms to facilitate peer-to-peer and business-to-business trade, services and finance.	It is important to carefully consider the position of workers and customers in these platforms. Frenken et al. (2017) for example voice concerns about the quality of work and the potential that digital platforms may undermine social security. These developments necessitate a careful modernisation of labour market protection and social security systems in line with proposals in sections 3.4 and adequate investment in human capital in line with proposals in section 3.8, to ensure digitalisation contributes to inclusive growth.	The digital revolution is beginning to change the way we do business across the board. It touches the very institutions that allocate capital, labour and knowledge in society (deGrijse, 2016; Ferrari, 2016; MacKenzie, 2015; Lin et al. 2009). The UK is leading in platform based financial innovation and in a position to set the standards. A strong infrastructure with clear and well-designed open standards will promote innovation and the creation of new services and creates opportunities for all to contribute and participate. Crowdfunding, crowdsourcing, self-employment and open innovation are all greatly leveraged with digital technology.
45	3.6.3	Knowledge Diffusion after Failure	We propose to set up publicly funded "entrepreneurial knowledge observatories"	Our consortium agreed that a lot of useful knowledge, perhaps of a more applied and tacit nature, is generated in the entrepreneurial process, particularly when ventures fail. That knowledge is lost when entrepreneurs do not share their experiences. However, as that is not their core business and private incentives are absent, it makes sense to publicly fund the collection, curation and diffusion of that knowledge.	In the UK there is a relatively high rate of firm formation and failure. This is beneficial and signals a healthy entrepreneurial ecosystem generating a lot of variety and selecting quick in a tough market environment. However, this also implies a lot of knowledge is lost. Incentives to retain and disclose experiences of in particular failures, are low. Such knowledge constitutes a public good.
52	3.7.4	Knowledge Diffusion and Commercialisation	We propose experimenting with a (publicly funded) entrepreneurial leave of absence for R&D workers.	The idea behind that proposal is that a lot of R&D results currently are shelved at incumbent firms because they do not fit these firms' strategies and interests of the moment or outright go against their short-term interests. Instituting the right to an entrepreneurial leave of absence could then promote more spin-out entrepreneurship that may lead to new industries and activities.	Spin-out ventures are on average more innovative and successful than those started without industry experience. R&D employees engage with pressing problems in their sector and are therefore well-positioned to identify opportunities and assess technical feasibility.
55	3.8.2	Creativity in primary and secondary education	Push for reforms in primary and secondary education that promote creativity, a willingness to experiment, a tolerance of failure and out-of-the-box thinking.	More appreciation for creativity (and therefore tolerance of deviant behaviour) will probably shift the balance from business oriented to more creative entrepreneurship. Evidence from field experiments (Weitzel et al. 2010; Urbig et al. 2012) and in the FIRES-project (Lauritzen et al. 2017) suggest that creative entrepreneurs are more socially oriented than strictly business-oriented entrepreneurs. Promoting creativity in primary and secondary education, to the extent possible, is therefore a long-term strategy to promote productive entrepreneurship that will create innovative, sustainable and inclusive growth (Stam et al. 2012).	The weakness in the UK we most try to address is low levels of absorptive capacity and firm specific human capital. UK citizens are willing to start a firm, but not so much willing to work for one and invest a lot in its success. Fostering a more entrepreneurial mindset, will in the long run make jobs in start-ups and new ventures more appealing, even for the non-entrepreneurs.

#	Section	Title	Proposal	Explanation	In the UK
59	3.8.4	Universities	Educate the young and bright to be more entrepreneurial before they make their career choices.	Recognising the importance of this European model of knowledge diffusion, European universities can take a larger role in the transition to a more Entrepreneurial Society in Europe. This starts with simple no-regret policies that have been proposed before (i.e. the European Commission's Entrepreneurship 2020 Action Plan).	This proposal is an ingredient in almost any Entrepreneurship Strategy and indeed most UK universities offer courses in entrepreneurship. It is perhaps more important that an entrepreneurial spirit is brought in the curricula more broadly. By going from desk to action research, students can be taught entrepreneurial skills even when learning about other topics. Trial and error and learning from failure are traits that any UK pupil should embrace.
61	3.8.4	Universities	Encourage university faculty to stimulate entrepreneurial initiatives while incentives for university spinoffs are increased.	Most US universities have a Technology Transfer Office (TTO), an in-house organisation specialising in assisting academic entrepreneurs in commercialising their inventions. However, a TTO could also hinder the commercialisation of useful technologies by making the process too bureaucratic and focusing on its own narrowly defined proprietary interests and key performance indicators (Baumol et al. 2007; Kauffman Foundation 2008). Therefore, we propose to promote team start-ups at universities as opposed to trying to sell university knowledge through licence agreements and patents.	UK initiatives to form clusters around its academic centres of excellence can be strengthened and made more inclusive to focus on team formation and new firm foundation as opposed to licencing and exploiting IP in more traditional ways. It involves more active engagement of the universities, but such activity would dovetail nicely with proposal 59 above.
62	3.8.5	Lifelong Learning Strategies	Develop mentoring programs by and for elderly employees and entrepreneurs.	FIRES deliverable 5.8 has proposed entrepreneurship campaigns for the elderly as a no-regret option as age should not be considered a barrier to entrepreneurship (Proposal 27). Notably, here we feel it would also be beneficial to develop mentoring programs by and for elderly employees, for whom the transition to a more flexible labour market may be particularly challenging.	The population of the UK is ageing and will continue to do so over the coming decades. (ONS, 2017). This suggests it is important to keep the ageing population actively engaged. Entrepreneurship and self-employment have the great benefit that productivity declines can be absorbed by working less hours and at lower wages with much less problems.
63	3.8.5	Lifelong Learning Strategies	Experiment with guaranteed public sector jobs to earn a minimum income. Jobs in young, innovative start-ups should easily compete with such guaranteed public sector jobs, both on wage and content.	The basic idea is that the public sector simply absorbs excess labour when activity in the private sector declines and releases it again when the private sector is expanding. Replacing the buffer of unemployed by a buffer of publicly employed labour. In that way, human capital can be maintained while access to the human capital remains guaranteed.	This proposals goes a step beyond the 2013 Universal Credit system currently being phased in. It extends that program with an entitlement to (part-time) work and aims to maintain human capital when demand is slumping. It is an option, not an obligation to accept such public service jobs and under the Universal Credit system such work will increase earned income. Of course, these jobs should not be so attractive that people get stuck in them. Hourly wages can be kept very low.

In column 1 we find the number under which they were presented in Part I and column 2 gives the section number where one can read more of the background and general motivation for the proposals. Column 3 lists the title and 4 the full proposal, where column 5 gives a short general motivation, while column 6 links the proposal to the analysis presented above.

The first two proposals (2 and 5) refer to intellectual property rights and call for the UK to experiment and negotiate for less stringent and encompassing IPR. This may sound counterintuitive and goes against the mainstream thinking that strong IPR promotes innovation and growth by providing incentives to generate knowledge. In stakeholder dialogues and discussions, as well as academic research, however, that conventional wisdom is often put on its head. Complex legal protection of IPR serves the interest of large incumbent corporates, who use IPR to maximise their profits. This rarely involves maximising the generation and diffusion of new knowledge and technology through commercialisation. The British experience in the industrial revolution, when IPR enforcement was expensive and scant, is a case in point. The reforms we propose would aim to restore IPR to its original purpose: give credit to the inventor, while promoting further incremental innovation and commercialisation by entrepreneurs. By opening up IPR, the UK would create opportunities for less sophisticated entrepreneurs to compete at the global frontier.

Proposals 11, 15 and 18 aim to increase the levels of informal investment in the UK. Lowering taxation on wealth should not be understood as an across the board reduction in such taxes. Indeed, if our diagnosis calls for a more inclusive entrepreneurial ecosystem, such a proposal would be strange indeed. We should therefore add that these proposals are to be interpreted as interventions in the taxation of wealth that will promote the accumulation of small private fortunes to be invested in small, everyday entrepreneurial ventures, through good old personal networks and modern crowd based

equity and lending platforms. Proposal 18 adds to the mix the credit information that banks typically consider proprietary. By disclosing that information at least for the publicly guaranteed loans, also the refused ones, private investors that can take on more risk can pick up on these opportunities to invest. Proposals 43 and 45 are very much aligned with the above in strengthening the infrastructure on which platform based financial (and other) services operate and creating central and publicly funded “Observatories” that collect, curate and disclose relevant and reliable information on entrepreneurial venturing and ventures, for entrepreneurs but also for (less-sophisticated) investors.

Proposals 27, 31, 52 and 63 directly aim to promote the flow of talent into entrepreneurial venturing. Proposal 27 targets marginal and vulnerable groups in the UK’s free and flexible labour markets, while proposal 52 aims to mobilise the relatively secure R&D workers, that may not consider (spin-out) entrepreneurship a viable strategy to date. Proposal 31 aims to make Britain’s workers more resilient in the face of faster changing jobs and labour markets. Employability in a modern economy depends to a large extent on the ability to learn, not knowledge that was acquired in school. Proposal 63 is intended to prevent the depreciation of human capital and complements the income floor in the social security system provided by the Universal Credit system. It adds an entitlement to work to prevent deskilling while unemployed.

Proposals 55, 59, 61 and 62 aim to strengthen the accumulation and maintenance of human capital throughout the average British career. In primary and secondary education, creativity and experimentation (with the required tolerance for failure) need to be pushed, whereas in higher education this line should be continued in support for entrepreneurial behaviour and venturing. Proposal 62 then aims to also keep that spirit alive on the work floor. The latter three proposals in the UK context translate into the government incentivising and stimulating such programs, as higher education and of course private firms are not under direct government control. Still, as two thirds of higher education budgets are still public and such funding is increasingly earmarked and performance based, the government can exert considerable influence.

The proposals individually and in combination aim to make UK entrepreneurs and SMEs more inclined to hire workers and also train them on the job and maintain their skills. Reforms in education aim to make workers more entrepreneurial while increasing their skills and flexibility whereas reforms in the financial system and tax code aim to allow for more private wealth to accumulate and flow to the SMEs and start-ups that VC and angel investors shun. The interventions proposed do not limit the mobility of resources in the UK, but will help to strengthen regional entrepreneurial ecosystems. Private wealth and informal investment, as well as training on the job in small and medium sized manufacturing firms tend to strengthen local and regional ecosystems, without risking leakage of resources to the centre. London can attract resources from all around the world and still thrive as the entrepreneurial hotspot of the UK.

It is possible that, even though all regions stand to benefit from these interventions, the fact that density and clustering tends to promote the quality and impact of entrepreneurial venturing, will imply that the same policy improvements will benefit London most. Still, that should not stop policy makers from pursuing these interventions as it is the UK citizens, not its administrative units per se that the national government should care about. In addition, the UK has effective automatic transfer systems in social security and the National Health Service that will help maintain a high quality of life throughout the country, even if the available entrepreneurial resources are deployed only in parts of the territory.

Of course these proposals will need a much more detailed discussion and form the starting point, not the final word on the policy debate. In this we gratefully join the debate the LSE Growth

Committee (2017)'s report has sparked in UK policy circles. We agree to a large extent with their analysis of the UK's challenges, but by focusing on strengthening economic resilience, we believe our interventions' success depends a lot less on uncertain political and technological processes the UK cannot hope to control. Moreover, if adopted, our proposals all require careful implementation and evaluation to complete the 7-step policy cycle presented in the introduction to this Part. Based on our analysis of the situation, we propose the patient consider this set of interventions to improve and maintain the health of its entrepreneurial ecosystem. That will be a key asset for the UK, whatever the circumstances.

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Appendix

Table A1: North East (UK) REDI report card

	PILLARS		INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES	
Entrepreneurial Attitudes	Opportunity perception	0.50	Market Agglomeration	0.89	Opportunity Recognition	0.57
	Start-up skills	0.45	Quality of Education	0.68	Skill Perception	0.51
	Risk Acceptance	0.92	Business Risk	1.00	Risk Perception	0.75
	Networking	0.54	Social Capital	0.82	Know Entrepreneurs	0.45
	Cultural support	0.81	Open Society	0.87	Career Status	0.80
	Entrepreneurial Attitudes 49.6					
Entrepreneurial Abilities	Opportunity startup	0.78	Business Environment	0.79	Opportunity Motivation	0.91
	Technology Absorption	0.41	Absorption Capacity	0.56	Technology Level	0.61
	Human Capitals	0.82	Education and Training	0.79	Educational Level	0.91
	Competition	0.75	Business Strategy	0.73	Competitors	0.88
	Entrepreneurial Abilities 52.4					
Entrepreneurial Aspirations	Product innovation	0.48	Technology Transfer	0.75	New Product	0.63
	Process innovation	0.42	Technology Development	0.58	New Technology	0.61
	High growth	0.35	Clustering	0.55	Gazelle	0.59
	Globalisation	0.45	Connectivity	0.62	Export	0.62
	Financing	0.07	Financial Institutions	0.77	Informal Investment	0.20
	Entrepreneurial Aspirations 30.8					
	GEI	44.3	Institutional	0.74	Individual	0.65

Table A2: North West (UK) REDI report card

	PILLARS		INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES	
Entrepreneurial Attitudes	Opportunity perception	0.62	Market Agglomeration	0.94	Opportunity Recognition	0.67
	Start-up skills	0.62	Quality of Education	0.74	Skill Perception	0.65
	Risk Acceptance	0.91	Business Risk	1.00	Risk Perception	0.74
	Networking	0.58	Social Capital	0.87	Know Entrepreneurs	0.47
	Cultural support	0.83	Open Society	0.88	Career Status	0.84
	Entrepreneurial Attitudes 61.5					
Entrepreneurial Abilities	Opportunity startup	0.74	Business Environment	0.84	Opportunity Motivation	0.73
	Technology Absorption	0.48	Absorption Capacity	0.63	Technology Level	0.65
	Human Capitals	0.74	Education and Training	0.84	Educational Level	0.73
	Competition	0.43	Business Strategy	0.58	Competitors	0.66
	Entrepreneurial Abilities 53.7					
Entrepreneurial Aspirations	Product innovation	0.34	Technology Transfer	0.72	New Product	0.54
	Process innovation	0.48	Technology Development	0.63	New Technology	0.62
	High growth	0.51	Clustering	0.64	Gazelle	0.69
	Globalisation	0.25	Connectivity	0.82	Export	0.34
	Financing	0.28	Financial Institutions	0.88	Informal Investment	0.43
	Entrepreneurial Aspirations 36.0					
	GEI	50.4	Institutional	0.79	Individual	0.63

Table A3: East Midlands (UK) REDI report card

	PILLARS		INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES	
Entrepreneurial Attitudes	Opportunity perception	0.56	Market Agglomeration	0.68	Opportunity Recognition	0.72
	Start-up skills	0.63	Quality of Education	0.73	Skill Perception	0.67
	Risk Acceptance	1.00	Business Risk	1.00	Risk Perception	0.89
	Networking	0.67	Social Capital	0.90	Know Entrepreneurs	0.55
	Cultural support	0.76	Open Society	0.85	Career Status	0.74
	Entrepreneurial Attitudes 64.4					
Entrepreneurial Abilities	Opportunity startup	0.63	Business Environment	0.79	Opportunity Motivation	0.61
	Technology Absorption	0.51	Absorption Capacity	0.62	Technology Level	0.69
	Human Capitals	0.73	Education and Training	0.84	Educational Level	0.70
	Competition	0.80	Business Strategy	0.76	Competitors	0.88
	Entrepreneurial Abilities 60.7					
Entrepreneurial Aspirations	Product innovation	0.79	Technology Transfer	0.74	New Product	0.81
	Process innovation	0.66	Technology Development	0.68	New Technology	0.74
	High growth	0.33	Clustering	0.55	Gazelle	0.59
	Globalisation	0.49	Connectivity	0.86	Export	0.53
	Financing	0.32	Financial Institutions	0.75	Informal Investment	0.49
	Entrepreneurial Aspirations 48.5					
	GEI	57.9	Institutional	0.77	Individual	0.69

Table A4: West Midlands (UK) REDI report card

	PILLARS		INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES	
Entrepreneurial Attitudes	Opportunity perception	0.64	Market Agglomeration	0.87	Opportunity Recognition	0.71
	Start-up skills	0.61	Quality of Education	0.74	Skill Perception	0.65
	Risk Acceptance	1.00	Business Risk	1.00	Risk Perception	0.88
	Networking	0.59	Social Capital	0.87	Know Entrepreneurs	0.49
	Cultural support	0.77	Open Society	0.85	Career Status	0.78
	Entrepreneurial Attitudes 62.3					
Entrepreneurial Abilities	Opportunity startup	0.78	Business Environment	0.78	Opportunity Motivation	0.97
	Technology Absorption	0.41	Absorption Capacity	0.59	Technology Level	0.60
	Human Capitals	0.73	Education and Training	0.80	Educational Level	0.76
	Competition	0.82	Business Strategy	0.82	Competitors	0.79
	Entrepreneurial Abilities 59.7					
Entrepreneurial Aspirations	Product innovation	0.40	Technology Transfer	0.66	New Product	0.60
	Process innovation	0.39	Technology Development	0.60	New Technology	0.55
	High growth	0.54	Clustering	0.66	Gazelle	0.70
	Globalisation	0.49	Connectivity	0.88	Export	0.52
	Financing	0.26	Financial Institutions	0.82	Informal Investment	0.42
	Entrepreneurial Aspirations 39.8					
	GEI	54.0	Institutional	0.78	Individual	0.67

Table A5: East of England REDI report card

	PILLARS		INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES	
Entrepreneurial Attitudes	Opportunity perception	0.59	Market Agglomeration	0.61	Opportunity Recognition	0.80
	Start-up skills	0.71	Quality of Education	0.78	Skill Perception	0.70
	Risk Acceptance	1.00	Business Risk	1.00	Risk Perception	0.87
	Networking	0.75	Social Capital	0.91	Know Entrepreneurs	0.64
	Cultural support	0.79	Open Society	0.87	Career Status	0.72
	Entrepreneurial Attitudes 61.4					
Entrepreneurial Abilities	Opportunity startup	0.79	Business Environment	0.85	Opportunity Motivation	0.79
	Technology Absorption	0.74	Absorption Capacity	0.73	Technology Level	0.84
	Human Capitals	0.83	Education and Training	0.88	Educational Level	0.80
	Competition	1.00	Business Strategy	1.00	Competitors	0.70
	Entrepreneurial Abilities 65.6					
Entrepreneurial Aspirations	Product innovation	0.62	Technology Transfer	0.95	New Product	0.67
	Process innovation	0.94	Technology Development	0.91	New Technology	0.72
	High growth	0.73	Clustering	0.70	Gazelle	0.81
	Globalisation	0.51	Connectivity	1.00	Export	0.49
	Financing	0.17	Financial Institutions	1.00	Informal Investment	0.30
	Entrepreneurial Aspirations 49.2					
	GEI	58.7	Institutional	0.87	Individual	0.70

Table A6: South East UK REDI report card

	PILLARS		INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES	
Entrepreneurial Attitudes	Opportunity perception	0.70	Market Agglomeration	0.75	Opportunity Recognition	0.83
	Start-up skills	0.91	Quality of Education	0.85	Skill Perception	0.81
	Risk Acceptance	0.93	Business Risk	1.00	Risk Perception	0.78
	Networking	0.67	Social Capital	0.92	Know Entrepreneurs	0.53
	Cultural support	0.83	Open Society	0.90	Career Status	0.75
	Entrepreneurial Attitudes 73.4					
Entrepreneurial Abilities	Opportunity startup	0.79	Business Environment	0.89	Opportunity Motivation	0.69
	Technology Absorption	0.77	Absorption Capacity	0.85	Technology Level	0.80
	Human Capitals	0.94	Education and Training	0.96	Educational Level	0.82
	Competition	0.98	Business Strategy	0.96	Competitors	0.74
	Entrepreneurial Abilities 77.4					
Entrepreneurial Aspirations	Product innovation	0.40	Technology Transfer	0.89	New Product	0.55
	Process innovation	0.80	Technology Development	0.83	New Technology	0.70
	High growth	0.64	Clustering	0.82	Gazelle	0.71
	Globalisation	0.50	Connectivity	1.00	Export	0.49
	Financing	0.69	Financial Institutions	0.98	Informal Investment	0.70
	Entrepreneurial Aspirations 58.0					
	GEI	69.6	Institutional	0.90	Individual	0.71

Table A7: South West (UK) REDI report card

	PILLARS		INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES	
Entrepreneurial Attitudes	Opportunity perception	0.54	Market Agglomeration	0.52	Opportunity Recognition	0.81
	Start-up skills	0.75	Quality of Education	0.77	Skill Perception	0.76
	Risk Acceptance	1.00	Business Risk	1.00	Risk Perception	0.89
	Networking	0.69	Social Capital	0.92	Know Entrepreneurs	0.56
	Cultural support	0.75	Open Society	0.85	Career Status	0.69
	Entrepreneurial Attitudes 67.6					
Entrepreneurial Abilities	Opportunity startup	0.73	Business Environment	0.74	Opportunity Motivation	0.95
	Technology Absorption	0.79	Absorption Capacity	0.69	Technology Level	0.91
	Human Capitals	0.75	Education and Training	0.91	Educational Level	0.67
	Competition	0.92	Business Strategy	0.88	Competitors	0.80
	Entrepreneurial Abilities 71.6					
Entrepreneurial Aspirations	Product innovation	0.46	Technology Transfer	0.74	New Product	0.62
	Process innovation	0.37	Technology Development	0.65	New Technology	0.48
	High growth	0.57	Clustering	0.68	Gazelle	0.72
	Globalisation	0.52	Connectivity	0.79	Export	0.59
	Financing	0.51	Financial Institutions	0.93	Informal Investment	0.60
	Entrepreneurial Aspirations 47.7					
	GEI	62.3	Institutional	0.79	Individual	0.72

Table A8: Wales REDI report card

	PILLARS		INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES	
Entrepreneurial Attitudes	Opportunity perception	0.43	Market Agglomeration	0.57	Opportunity Recognition	0.63
	Start-up skills	0.51	Quality of Education	0.68	Skill Perception	0.59
	Risk Acceptance	0.89	Business Risk	1.00	Risk Perception	0.72
	Networking	0.61	Social Capital	0.86	Know Entrepreneurs	0.52
	Cultural support	0.79	Open Society	0.87	Career Status	0.78
	Entrepreneurial Attitudes 59.2					
Entrepreneurial Abilities	Opportunity startup	0.56	Business Environment	0.71	Opportunity Motivation	0.65
	Technology Absorption	0.33	Absorption Capacity	0.59	Technology Level	0.51
	Human Capitals	0.72	Education and Training	0.86	Educational Level	0.68
	Competition	0.73	Business Strategy	0.71	Competitors	0.88
	Entrepreneurial Abilities 54.4					
Entrepreneurial Aspirations	Product innovation	0.33	Technology Transfer	0.71	New Product	0.54
	Process innovation	0.35	Technology Development	0.55	New Technology	0.56
	High growth	0.35	Clustering	0.44	Gazelle	0.65
	Globalisation	0.39	Connectivity	0.64	Export	0.55
	Financing	0.46	Financial Institutions	0.81	Informal Investment	0.59
	Entrepreneurial Aspirations 37.5					
	GEI	50.4	Institutional	0.71	Individual	0.63

Table A9: Northern Ireland (UK) REDI report card

	PILLARS		INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES	
Entrepreneurial Attitudes	Opportunity perception	0.38	Market Agglomeration	0.62	Opportunity Recognition	0.55
	Start-up skills	0.42	Quality of Education	0.65	Skill Perception	0.50
	Risk Acceptance	0.78	Business Risk	1.00	Risk Perception	0.57
	Networking	0.59	Social Capital	0.89	Know Entrepreneurs	0.46
	Cultural support	0.80	Open Society	0.88	Career Status	0.73
	Entrepreneurial Attitudes 55.5					
Entrepreneurial Abilities	Opportunity startup	0.83	Business Environment	0.80	Opportunity Motivation	1.00
	Technology Absorption	0.49	Absorption Capacity	0.58	Technology Level	0.69
	Human Capitals	0.61	Education and Training	0.76	Educational Level	0.65
	Competition	0.76	Business Strategy	0.68	Competitors	0.99
	Entrepreneurial Abilities 62.0					
Entrepreneurial Aspirations	Product innovation	0.56	Technology Transfer	0.66	New Product	0.70
	Process innovation	0.55	Technology Development	0.61	New Technology	0.73
	High growth	0.57	Clustering	0.73	Gazelle	0.70
	Globalisation	0.36	Connectivity	0.59	Export	0.54
	Financing	0.39	Financial Institutions	0.88	Informal Investment	0.52
	Entrepreneurial Aspirations 47.4					
	GEI	55.0	Institutional	0.74	Individual	0.67