Nesta...

A MANIFESTO FOR THE CREATIVE ECONOMY

Hasan Bakhshi, Ian Hargreaves and Juan Mateos-Garcia

April 2013

About Nesta

Nesta is the UK's innovation foundation. An independent charity, we help people and organisations bring great ideas to life. We do this by providing investments and grants and mobilising research, networks and skills.

Nesta Operating Company is a registered charity in England and Wales with company number 7706036 and charity number 1144091. Registered as a charity in Scotland number SCO42833.
Registered office: 1 Plough Place, London, EC4A 1DE.

www.nesta.org.uk

A MANIFESTO FOR THE CREATIVE ECONOMY

About the authors

A Manifesto for the Creative Economy is the work of Hasan Bakhshi, Ian Hargreaves and Juan Mateos-Garcia.

Hasan Bakhshi is Director, Creative Economy in Nesta's Policy & Research Unit and Research Fellow at the Queensland University of Technology. He has led Nesta's creative economy policy and research work for the past six years. His recent work has included the *Next Gen* report with Ian Livingstone, Alex Hope and Juan Mateos-Garcia and the design and oversight of the Digital R&D Funds for the Arts. His earlier work at Nesta included co-authoring the *Staying Ahead* report with Will Hutton and Philippe Schneider.

Ian Hargreaves was a Nesta Research Fellow in 2012/13. He is Professor of Digital Economy at Cardiff University and author of *Digital Opportunity, A Review of Intellectual Property and Growth,* commissioned by the UK Government and published in 2011. In 2009, the Welsh Government commissioned him to lead a review of the creative industries in Wales which led in 2010 to the publication of *The Heart of Digital Wales: a review of creative industries.* Most of Ian's career has been spent in journalism: he was Deputy Editor of the FT; Editor of the Independent; Editor of the New Statesman and Director of BBC News and Current Affairs.

Juan Mateos-Garcia is Creative Industries Research Fellow at Nesta and CENTRIM at the University of Brighton. His recent work has included the *Next Gen* report with Ian Livingstone, Alex Hope and Hasan Bakhshi, and the *Creative Clusters and Innovation* report with Caroline Chapain, Lisa de Propris, Stewart MacNeill, and Phil Cooke. He is currently working on the Brighton Fuse study of the Brighton Creative and Digital cluster funded by the Arts and Humanities Research Council.

Acknowledgements

We are grateful to the following individuals, who contributed encouragement, ideas, challenge and valuable disagreement: Lynne Brindley, Diane Coyle, Stuart Cunningham, Robin Foster, Andrew Gowers, John Hartley, Michael Keane, Jon Kingsbury, Charles Leadbeater, Brian McLaren, Geoff Mulgan, John Newbigin, Kate O'Connor, Mark Oliver, Mark Pearson, Rick Rylance, Nick Starr, Ed Steinmueller, Emily Thomas, Bill Thompson, Neil Watson and Stian Westlake.

We are also grateful to Alan Freeman and Peter Higgs, co-authors with Hasan of *A Dynamic Mapping of the UK's Creative Industries* on which Chapter Three of this manifesto heavily draws, to Jon Watts and Stephen Adshead for their work on the *Assessment of Market and Technology Trends,* and to Mark Spilsbury for his assistance in producing the GVA estimates. Carlos Gutierrez provided research assistance.

CONTENTS

FOREWORD		6
SUMMARY		7
1	WHY THIS MANIFESTO? WHY NOW?	10
2	HOW CREATIVE BRITAIN LOST ITS WAY	17
3	WHAT IS THE CREATIVE ECONOMY?	26
4	CREATIVE TECHNOLOGIES AND MARKETS	35
5	A POLICY AGENDA FOR THE CREATIVE ECONOMY	43
6	RESEARCH AND DEVELOPMENT	51
7	ACCESS TO FINANCE	63
8	ARTS AND CULTURE	71
9	COMPETITION	79
10	COPYRIGHT WARS	90
11	SKILLS AND EDUCATION	96
12	A MANIFESTO FOR THE CREATIVE ECONOMY	107
ENDNOTES		110

FOREWORD

These are exciting times for anyone in the creative economy. While much of the rest of the economy appears becalmed, it's continuing to experience a heady mix of dynamic growth, a proliferation of new business models, as well as stunning new technologies that are making culture even more intense and engaging.

At Nesta, we're fascinated to see what happens next. Our interest derives partly from our practical work – which stretches from digital arts to games, mentoring to media. It also derives from our research, much of which aims to bring greater clarity and rigour to understanding the dynamics of these industries, part of a broader programme of work we've been doing on how policy can support innovation, and how, through what we call *Plan I,* the UK can follow a strategy for innovation-led growth.

This manifesto shows very clearly both what's possible – and what could go wrong. It sets out both analysis and prescription, and our hope is that people will engage seriously with both.

For several decades there has been much talk about digital technologies, about convergence, and about the transformation of old art forms, from the book to the film. Some of the rhetoric was overheated, and some of the predictions were slow to materialise. That led many to make the opposite mistake of concluding that because the revolution didn't materialise immediately, it had been postponed indefinitely.

Instead, as this report shows, the digital revolution is now very much underway, and almost certainly accelerating. This has obvious implications for the UK, given the remarkable scale of the creative economy. It demands a radical rethink of policies far beyond the traditional boundaries of the arts, encompassing everything from schools to competition policy.

But I hope the analysis set out here will also be of interest in many other parts of the world which also want to make more of a living out of creativity. A previous generation of ideas and policies – many of which spread across the world over the last two decades – has run its course. It's now time for a refresh. This manifesto shows how.

Geoff Mulgan
Chief Executive of Nesta

SUMMARY

The UK's creative economy is one of its great national strengths, historically deeply rooted and accounting for around one–tenth of the whole economy. It provides jobs for 2.5 million people, more than in financial services, advanced manufacturing or construction. This creative workforce has in recent years grown four times faster than the workforce as a whole.

Behind this success, however, lies much disruption and business uncertainty, associated with digital technologies. Previously profitable business models have been swept away, young companies from outside the UK have dominated new Internet markets, and some UK creative businesses have struggled to compete.

UK policymakers too have failed to keep pace with developments in North America and parts of Asia. But it is not too late to refresh tired policies. As the web's inventor, Sir Tim Berners–Lee puts it: *"the Web as I envisaged it, we have not seen it yet. The future is still so much bigger than the past"*. On many fronts, technology continues to evolve rapidly and radically, guaranteeing further disturbances to established players and opportunities for innovators. Big Data, the Internet of Things, Wearable Computers, Assisted Creativity and the Maker Movement provide examples of this continued dynamic.

This manifesto sets out ten areas in which policy refreshment is urgent. The top priorities are:

- To ensure that the next generation of the Internet is truly open. This calls for contestable creative economy markets, well supervised by competition authorities which have the information and authority to act speedily and effectively when there are concerns about market abuse.

- All teenagers should have the opportunity to learn creative digital skills, such as designing apps and games, as part of a fusion in the curriculum covering technology and art, as well as maths, science and the humanities.

- Policy tools designed to incentivise innovation, from tax relief to procurement rules, should be adapted to the needs of the creative economy.

- The UK's publicly funded creative powerhouses, from the BBC to universities, arts organisations and museums, should make the most of the next generation of digital technologies.

Our ten policy recommendations are, in full:

PROPOSAL ONE

The Government should adopt our proposed new definitions of the creative industries and the wider creative economy. These are simple, robust and recognise the central role of digital technologies.

PROPOSAL TWO

Policymakers should establish a 'creative innovation system' framework within which strategic priorities can be addressed in a coherent and effective manner.

PROPOSAL THREE

The Government should make R&D tax relief more accessible to creative businesses. Technology Strategy Board programmes should be further broadened to address the needs of the creative economy. Public procurement rules should be changed to open up opportunities for smaller digital firms. Cross-disciplinary Research Council knowledge exchange initiatives should be rigorously evaluated and the lessons applied in a further round of investment. More international collaborations with leading research centres should be encouraged.

PROPOSAL FOUR

Local policymakers should observe our seven-point guide for developing creative clusters.

PROPOSAL FIVE

Government should ensure that its generic business finance schemes do not discriminate against creative businesses, and that regulations help the development of financial Internet platforms (such as crowdfunding sites). Absent hard evidence on their efficacy, government should resist introducing new sector-specific finance programmes. A higher priority is to coordinate the collection and publication of investor-friendly data through the Creative Industries Council, thus supporting the development of a thicker market for risk finance.

PROPOSAL SIX

The Treasury and the DCMS should undertake a broad-based assessment of the value of public arts and cultural spending in the UK, drawing upon similar work on the natural environment and the Cultural Value Project of the Arts and Humanities Research Council. Funding decisions should be justified in the light of criteria that emerge from this work.

PROPOSAL SEVEN

Funders should incentivise experimentation with digital technologies by arts and cultural organisations and allocate a sustained percentage of their resources to digital R&D, ensuring that the evidence arising from this work is openly shared. Under its new leadership, the BBC should publish in 2013 a strategy to reflect its Digital Public Purpose in the period to 2018, not least through the ambitious vehicle of its Digital Public Space initiative.

PROPOSAL EIGHT

Ofcom should be given powers to gather information in all Internet markets in order to maximise the chances of sound and timely judgments about the emergence of potentially abusive market power and other market concerns (an 'early warning system'). Ofcom should contribute a regularly updated strategic overview of these issues, working closely with the Information Commissioner's Office, the Intellectual Property Office, the Competition and Markets Authority and other relevant agencies. Ofcom's remit should be broadened to advise the Government on the actions needed to ensure the UK enjoys a flourishing, open Internet, balancing the interests of consumers and citizens and committed to supporting innovation and growth. These changes should be a central feature in any Communications Bill planned for 2013/14.

PROPOSAL NINE

UK copyright rules and exceptions should be re-balanced, along the lines proposed by the UK Government, and also at the European level as part of the drive for a European Digital Single Market. A new mechanism for enabling vastly increased and more efficient rights licensing transactions (through the proposed Copyright Hub) should be further developed during 2013, again with potential European replication.

PROPOSAL TEN

Governments across the UK should make a Schools Digital Pledge, designed to ensure that the school curriculum, including its representation in the English Baccalaureate, brings together art, design, technology and computer science and that young people are able to enjoy greater opportunities to work creatively with technologies, both in and out of school. Steps should also be taken to address the disconnect between what UK creative businesses need from graduates and what universities are teaching them. Measures to improve the quality of graduate employment data made available to prospective applicants for creative courses (including industry-approved course kitemarks) should be extended.

1 WHY THIS MANIFESTO? WHY NOW?

The goal of this manifesto is to identify what policymakers, educators, businesses and regulators need to do to ensure that the UK's creative economy thrives in the coming decade. This important part of the UK's economy has a considerable record of success. According to our new definitions and estimates, the creative economy employs 2.5 million people (greater than financial services, advanced manufacturing and construction) and accounts for at least 9.7 per cent of the UK's Gross Value Added.

This success reflects an outstanding tradition in creative content, and a wealth of talent in Britain's creative people and entrepreneurs, underpinned by natural advantages such as the global reach of the English language. It also reflects supportive public policies, including a long-established commitment to the arts and cultural sector and a well-resourced and adaptive model of public service broadcasting. Policymakers in the UK cottoned on early to the contribution that the creative industries make to the economy, and their interest has been widely studied and copied around the world.

We believe, however, that this success is now at risk. The ubiquitous digital communications technologies which have emerged in the last 15 to 20 years present an epochal challenge to the business models of the UK's creative businesses threatening to make obsolete the policies and institutions that have been vital to past success. The reaction of policymakers and creative businesses to these disruptive shifts has so far been uncertain.

This uncertainty of response has been most striking in the UK's resistance to the necessary adaptation of copyright law to digital realities. But it extends more broadly into the design of policies to support R&D; to how the creative economy is taxed and how it is financed; to the response of the subsidised arts and cultural sector to digital technologies; to the regulation of competition; and to the design of the school curriculum.

The prevailing rhetoric of this debate, amplified by the campaigns of lobbyists on all sides, has often put technology companies and creative businesses at loggerheads with each other, when instead the situation calls for well supervised, contestable markets that respond to changed circumstances and facilitate innovation. In this manifesto, we argue that this conflict creates a drag on our creative industries and, increasingly, upon the wider creative economy. Given the unusually high importance of these sectors to UK jobs and prosperity, this is not a price the UK can afford to pay.

The creative economy is one of the few industrial areas where the UK has a credible claim to be world-leading. This leadership position cannot be taken for granted, as we know from such positions lost in the automotive industry in the 1960s,[1] computing in the post-war period[2] and the chemicals industry in the third quarter of the 19th century.[3] In all these cases, a more accurate assessment of strengths and weaknesses and a more systematic response might have increased the chances of a better outcome. We set out, therefore, a new policy agenda to sustain the UK's creative economy in the next decade, based on a more constructive relationship between technology companies and creative businesses, and on grounded definitions and data revised for the digital era.

1. The new industrial revolution

The rapid diffusion of information and communication technologies, most prominently the Internet, is transforming modern economies and societies, threatening some established creative businesses, such as newspapers, and massively disrupting others, like those in the recorded music industry.[4,5] Meanwhile, the biggest winners are digital, American companies focused upon either distribution or devices: Google, Facebook, Amazon and Apple.

You could say this pitch for a UK creative economy policy refresh comes too late, as the Internet is already approaching its third decade of global disruption, but that would not be right. The ICT revolution is not yet half done.[6] As the web's inventor, Sir Tim Berners-Lee puts it, *"the Web as I envisaged it, we have not seen it yet. The future is still so much bigger than the past."*[7]

In these circumstances, the UK's creative economy has as good a chance as almost any country's of doing well. Its strengths include: a long track record of creative excellence backed by public funding; a decent tradition of technology creation; diverse and dynamic cities housing world-class cultural institutions (most obviously, but not only, London); a public that is amongst the world's most sophisticated in its use of digital technology; strong, long-established and diverse corporate players in digital, such as BSkyB, WPP, the Open University and Pearson, and a start-up ecosystem ranked top in Europe (though seventh in the world) according to Startup Genome.[8] What we do not have is a policy stance towards the creative economy which is truly fit for this stage in the digital era.

This matters because the Internet stakes are so high. The Boston Consulting Group thinks that the Internet Economy of the G-20 group of countries will be worth $4.2 trillion in 2016.[9] Booz claims that 'universal digitisation' would have been worth an additional £63 billion to UK GDP in 2011.[10] McKinsey says that the Internet contributed a tenth of all economic growth in the G-8 countries over the 15 years to 2009.[11] Copenhagen Economics says the completion of Europe's Digital Single Market is as economically significant today as the achievement of the original EU single market, which underpinned the continent's prosperity for a generation.[12]

The ultra-rapid speed of Internet-enabled smart phones, and the growth of innovative broadband providers like B4RN is circumventing the slowness of incumbent telecommunications firms in rolling out 'fibre in the ground', and forcing them to offer competitive products. In emerging markets, mobile phones not computers are the gateway into the Internet. In Europe and North America, those who suffer 'digital exclusion', usually meaning lack of regular access to the Internet, remain significant though in a diminishing minority: roughly 20 per cent of the population.[13] Although there are 'dark sides' to the Internet – including fears about loss of privacy, cyber security, illicit file sharing and uncontrolled access to undesirable content – most governments have concluded that they need to design policy to encourage the benign effects of the Internet upon innovation and economic growth, whilst mitigating the risks.

So, even in tough economic times, political leaders show willingness to invest in broadband infrastructure because of the high returns on offer.[14] The average impact of broadband on annual GDP growth in the Euro-15 countries between 2002 and 2007 has been estimated at 0.6 per cent, accounting for almost 17 per cent of total growth over this period.[15] A ten percentage point increase in broadband penetration between 1999 and 2007 is judged to have raised annual per capita growth between 0.9 and 1.5 per cent in OECD countries.[16]

What makes new information and communications technologies so economically powerful? The answer is that their impacts are felt everywhere. Their pervasiveness is why economists consider them one of a small number of 'general purpose technologies' – like steam power and electricity – that change entire economic growth trajectories in industries that use them.[17] The Internet, one such information and communications technology, has created unprecedented opportunities for more distributed forms of organisation and open collaboration throughout the economy in areas as wide as retailing (eBay), software (GNU/Linux), travel (TripAdvisor), finance (Kickstarter), and manufacturing (the Maker Movement).[18, 19]

But a successful digital economy requires much more than investment in broadband pipes: it also calls for investment in new skills, the re-engineering of production processes and new business models to create and capture value. We see this in play on many fronts: the existence of widespread computer programming skills shortages in the UK workforce;[20] the trend towards outsourcing corporate functions in industries like banking and retail; the global reconfiguring of logistics chains (the Post Office) and the hollowing out of British high streets (Jessops, HMV) while e-commerce booms.

Beyond the realm of economics, the Internet's disruption to social patterns is equally extensive; visible in how we stay in touch with friends and family, participate in communities of place and interest, and mobilise politically. Here too, cherished norms of behaviour are challenged, as new opportunities unfold.

We know how far-reaching the economic transformations wrought by disruptive technologies can be. Japan's once mighty consumer electronics industry sector is a current example: profitability has crashed, competitive edge has been lost.[21] Britain invented synthetic dye and modern steelmaking in the 1850s, but by 1900 had yielded its early lead in the chemicals and steel industries to Germany and the US.[22]

2. Impact on the creative economy

Today, the creative industries operate in a technology landscape changed beyond recognition since 1998 when the Department for Culture, Media and Sport (DCMS) first grouped together 13 business sectors whose connections had hitherto not been recognised by policy.

The average user in the UK spends almost a full day of each month online,[23] and the advertisers who traditionally financed news and entertainment production have followed her there: in 2009, the UK was the first country in the world where Internet advertising overtook advertising in other media, reaching £4.8 billion in 2011.[24] Almost six in ten own smart phones (second only to Spain) and the UK leads the world in digital radio and digital video recorder ownership too. Almost a quarter of UK Internet users claim to access TV online every week, higher than any other country except China (where broadband penetration is, however, much lower).[25] One of the world's biggest companies by market capitalisation, Apple, makes market-leading gadgets, but is also a leader in distributing digital creative content. The second and third most popular websites in the UK – Facebook and YouTube (after Google Search) – help their users share and navigate this content.[26]

In some cases, the rise of digital has been accompanied by a severe decline in analogue formats. This is strikingly the case in news, where, in the UK, all the main newspapers have suffered big reductions in print circulation and many smaller titles have disappeared entirely. In music, sales of physical formats such as CDs and vinyl have for the first time been overtaken by digital revenues.[27] In film, the disruption is visible in the demise of bricks and mortar rental outfits and in mail-order DVD rental, which is now forced to compete, in the UK, with video-on-demand services from the likes of Netflix UK, Lovefilm, Blinkbox and BSkyB's Now TV.

That this digital 'gale of creative destruction'[28] has struck the creative industries particularly hard is not surprising – many creative businesses produce and sell information goods that can be easily manipulated, distributed and stored using information and communication technologies. With some obvious exceptions, such as designer fashion, creative goods are easy to codify into bits. Digital technologies also give firms greater opportunities to target their products and services to consumers, a boon for innovative creative producers wanting to tap the public's desire for personalised experiences. They also afford artists new ways of expressing their personal visions, of differentiating their work from others, often through new, multi-media and multi-platform approaches.

New technologies have also changed the way we consume, share and talk about creative content via Internet social media platforms such as Facebook. Music and other live performance arts are regularly streamed on platforms like The Guardian Online and broadcast to digital cinemas and even museums and art galleries are following suit. The social circles in which we discuss and share ideas, and through which we discover news, media and cultural content, have greatly expanded and yet become more connected.[29]

At the same time, the boundaries between creative supply and demand have blurred, with the Internet now emerging as a mass-empowerment device for connecting individuals and businesses to a vast, global toolkit and repository of knowledge (Wikipedia, Khan Academy and, more recently, Massive Online Open Courses (MOOCs)). Users, hobbyists and amateurs, who only a few years ago would have been passive consumers, nowadays upload one hour of video content to YouTube every second. In the UK, the popularity of YouTube explains why the average time spent on video-sharing sites increased by 43 per cent in the year to March 2012.[30] In the US, the mobile usage of photo-sharing app Instagram overtook Twitter in August 2012.[31] Crowdsourcing platforms such as OpenStreetMap, TopCoder and Kaggle show different ways in which the Internet democratises the domain of expertise and creativity. Objects with Internet connections (the 'Internet of Things'), along with emerging technologies such as 3D printing, promise to transform craft and manufacturing.[32]

3. Innovation and growth in the UK's creative economy

This torrent of change presents UK creative businesses with a bewildering array of innovation opportunities, sometimes obscured by a blizzard of threats to existing business models. Digitisation lowers most costs of production and of reaching new markets – including in emerging economies – where increasingly affluent and connected audiences demand more creative goods and services.[33] It has generated entirely new media forms, such as online video games. It creates untold opportunities for preserving and providing greater access to the UK's cultural heritage. Digital distribution channels, in theory at least, reduce the UK's reliance on global 'gatekeepers' for the financing and marketing of creative productions, a problem for UK creative firms traditionally better at creating value than at capturing it.[34] This suggests that the Internet could help UK creative businesses overcome the traditional constraints on their scalability. As the UK economy struggles to grow out of its second dip into recession – with the worst five-year growth rate in peacetime since the 1920s[35] – it is more important than ever to ensure that the UK's creative industries are able to exploit all of these new growth opportunities. The Government has acknowledged this by including them in its *Plan for Growth*.[36]

In this manifesto, we seek to define a clear framework for policy, based on a simplified definition of the creative industries as *"those sectors which specialise in the use of creative talent for commercial purposes."*[37] But the creativity which drives these industries is also critical for many other parts of the economy.[38] This arises from growing pressure to differentiate products and services from international competitors, deploying aesthetic and symbolic expressions of quality (such as design, brand and cultural association)[39] which appear to be increasingly important to consumers and businesses. This is what we

and others mean by the creative economy, whose activities we define more generally as involving *"the use of creative talent for commercial purposes."*

The creative industries have a central position in this creative economy, because they specialise in creative activities, but also because they supply other sectors with creative inputs that increase innovation and productivity.[40] The past decade has seen businesses across the UK economy significantly increase their investments in creative intangible assets like design, software and advertising: between them, these categories accounted for over 40 per cent of overall investment in intangibles in 2009, compared with R&D which accounted for just 13 per cent.[41]

In these circumstances, we might have expected the historical strengths of the UK's creative industries to support a comfortable, even triumphant transition to digital markets and business models. But this has not been so: newer and smaller creative businesses in particular express their frustration with policies with regard to the issues addressed in this manifesto: education (visual effects), access to finance (music), intellectual property (archives), competition (book publishers) and infrastructure (video games).

Others' frustrations are also surely explained in part by the well-known '*Innovator's Dilemma*,'[42] which shows that past success generates inertias that obstruct adaptation to the new. In the music, film and now book publishing industries worldwide, some established players have resisted the adoption of new technologies where these could jeopardise established revenue streams or they have sought to retain or establish rules for accessing digital content via new technologies (such as release windows and encryption) which have often not made sense to consumers, who are increasingly accustomed to instant online purchase and wide open international transactions. Music is an often cited example, which tried to constrain the emergence of first recording and then a wave of copying technologies, culminating in digital distribution on the Internet, with its associated problems of rights piracy.[43]

The fear of cannibalising established revenue streams, while sometimes well founded,[44] can undermine willingness to experiment with new business models. In the policy arena, incumbents' resistance to change also encourages attempts at regulatory capture, most evident in policymakers' traditional hostility to flexibility in the Intellectual Property Regime, which is needed to reflect changing consumer expectations and practices and to prevent copyright from creating barriers to innovation in other parts of the economy, such as medical and other scientific research.[45]

This conservatism, we argue, is one of the reasons why UK policymakers have struggled to respond coherently or sufficiently to the transformations produced by information and communications technologies and the Internet: unclear whether the policy priority is the Creative Industries (*Creative Britain*, 2008),[46] the Creative Economy (*Cox Review*, 2005)[47] or the Digital Economy (*Digital Britain*, 2009).[48] There has, over time, been too ambivalent an attitude towards business-facing creative sectors like software, design and advertising and an unwillingness to adapt mainstream innovation and growth incentives, such as the R&D tax credit, to the needs of high-tech creative industries.[49] It is also reflected in a public debate which pits the American born-digital content distributors (especially Google and Amazon) as the enemy of UK creative industries when the truth is that the fortunes of these businesses are inextricably intertwined.

Meanwhile, the UK has an education system which promotes STEM (Science, Technology, Engineering, and Maths), not a multi-disciplinary mix of STEAM,[50] skills, and which up until now has gravely neglected the extensive demand within the changing creative economy for computer programming skills. On the whole, politicians and policymakers in the UK often appear insecure about whether to embrace the Internet (with its prospect of enhanced innovation and growth) or to recoil from it (illicit file sharing, loss of privacy and domination by American business giants).

In recent years, the confusion arising from this ambiguity has become more marked and more damaging. It is visible in the DCMS's decision in 2011 to drop software from its classification of the creative industries, and in its lack of remit to frame policy with a view to stimulating the wider creative economy.[51] It is there in the chaotic nature of the debate about the education and skills needs of the UK's creative economy, which has yielded an English Baccalaureate which will (following pressure) include computer science but which excludes art and design & technology; and which struggles on many fronts to respond to the scale of inter-disciplinarity demanded in the digital age. It has made us too cautious about empowering our communications regulator, Ofcom to evaluate incipient competition issues in fast-changing digital markets. And it is most striking of all in the acrimonious arguments about copyright between rights holders and technology companies, where UK governments have, traditionally, taken a highly defensive stance, making choices such as a succession of term extensions that disregard hard economic evidence.[52]

This pattern of behaviour, we believe, weakens both the capacities and incentives of UK businesses to innovate and so threatens the future contribution of the UK's creative economy. When we look at its digital capabilities, while there are the clear strengths that we have noted, there are critical areas where they are lacking. For example, there are no UK companies in the current crop of dominant Internet platforms that are today capturing so much economic value in the creative economy. Few UK content businesses have so far been able to fulfil the promise of the 'long tail' and build global digital distribution operations while retaining their independence. The UK has been unable to exploit its world-renowned archives of English language content, despite the admired strength of its cultural institutions, such the BBC and the British Library. And even in areas like video games, where the UK took an early lead in the creative economy, this too has slipped.

4. Our manifesto

In short, the UK's creative economy remains richly creative, but it faces an innovation problem. Or to put it another way, the UK's creative businesses risk failing to make the most of their underlying creativity if they are unable to adapt their business practices and structures to the possibilities and constraints of new technologies. What can be done?

The starting point is to ensure that the UK offers an environment to spur the kind of innovation UK creative businesses need to undertake. The Government's job is to set the right framework for growth. This includes contestable creative markets where transactions costs are low and the rewards to innovation are high. To enable this there must be a refreshed regulatory regime, which includes improved arrangements for intellectual property. The competition authorities, currently undergoing a major re-shape in the UK, have to be empowered to play a more effective and agile role.

Government must do what it is able to do to ensure that the UK's most innovative businesses – including the start-ups where the most disruptive innovations will come from – have access to the risk capital they need to experiment and grow. Careful consideration must also be given to where public investments through institutions like the BBC, the Technology Strategy Board and higher education institutions such as the Open University can support the development of UK-based global Internet platforms. Given the strength of its creative content and service businesses, the UK should also push for open and accessible platforms where the risks of market abuse by gatekeepers are lower.[53]

A front-rank creative economy must also have front-rank broadband infrastructure, an argument which has been well rehearsed elsewhere,[54] so we do not discuss it in detail in this manifesto, but it forms an important element in our view of what is needed. We also need to work harder at understanding and maximising the leverage that exists between the UK's strong publicly funded arts and cultural sector and the creative economy and the role that digital technologies can play in this.[55]

Cluster development policies in the devolved and regional economies must be prioritised on growing industrial clusters that fuse creativity and digital technologies.[56] The Government also needs to invest in the skills and talent of the creative people on whom the sector depends, investing not just in STEM knowledge but in art, design & technology.

In this manifesto, we set out ten clear recommendations which, if acted on, will substantially improve the innovation and growth prospects of the UK's creative economy. These recommendations cover a range of themes, some of which are the responsibility of the UK Government, while others are the responsibility of the devolved administrations in Scotland, Wales and Northern Ireland. The policy principles that we identify are applicable across the whole of the UK, but the specific ways in which these principles might be embraced may differ in the devolved nations, particularly where differences in policy and practice already exist. Where possible, we have sought to reflect these nuances.

The independence referendum planned for Scotland in 2014 may bring major constitutional change to that part of the UK, raising a multitude of policy questions for the creative industries across areas such as broadcasting, communications, fiscal policy and competition policy. While there is an urgent need for informed debate on these questions, this manifesto is not the place for that. We do not aim to cover every issue in detail, but to establish the right direction for policy in every part of the UK. It is also the case that many of the ideas promoted in this manifesto are as relevant for the whole of the European Union as for the UK; not least because UK law in areas such as communications, broadcasting, competition and intellectual property is framed at the European level. We take a number of opportunities to show where our proposals potentially extend to this pan–European context, though we acknowledge the potential impact of the current political debate about the UK's relationship with the European Union upon these matters.

If the course we recommend is followed, the UK will be able to exploit more effectively the opportunities that digital technologies and the Internet afford. That way, the UK's creative content and service businesses will be well placed to compete in global digital markets where we will see continued rapid growth. The stark alternative is a relative loss of competitive position.

If we respond vigorously to this challenge, the UK should increase its global market share: building new markets in Asia and the Americas and fending off competition globally from their lower cost exporters. It may even help make the UK a possible home to whatever small legion of new enterprises snaps at the heels of currently dominant Internet platforms like Google, Apple, Amazon and Facebook in the course of the next decade. Perhaps more important, it will ensure that one of the few sectors of the economy where the UK has a leading position internationally will continue to thrive, creating more high–quality jobs and making greater contributions to economic value added.

2 HOW CREATIVE BRITAIN LOST ITS WAY

1. *Creative Britain*

In the late 1990s, the UK pioneered[57] an approach to supporting its creative industries. Although viewed by critics to the left of the Blair Government as yet another example of the forward march of neo-liberal marketisation and by others as involving more rhetoric ('Cool Britannia') than substance, the 'Creative Britain' narrative generated a policy paradigm which has been studied if not copied all over the world[58] and which has been characterised as a highly effective 'policy brand'.[59] The simple power of the 'creative island' story was re-illustrated in Danny Boyle's acclaimed opening ceremony for the 2012 London Olympic Games.

This chapter considers the history of the Creative Britain project, from its political inception in 1997 to the present day, primarily with a view to identifying those risks to its further success which have emerged in recent years. We highlight points worth noting, whether these be visionary (the value of bold and motivational leadership) or cautionary (the risk of regulatory capture or incoherent policy). Without a grasp of this history, policymakers risk repeating its errors.

The 1998 *Creative Britain* book (in structure, an edited collection of speeches by the then Secretary of State for Culture, Media and Sport, Chris Smith) began with a visionary quotation from William Blake and continued:

> *"This book is about creativity. It is about the cultural ferment and imaginative heights to which creativity leads, the enormous impact that both creativity and culture have on society and the growing importance to the modern economy of Britain of all those activities and industries that spring from the creative impulse. And it is about the implications of all these things for the development of public policy, and the work of government."*[60]

From this, it was clear that the project had aspirations well beyond the obvious core territory of the arts and media, extending into design and even science, medicine and engineering; it spoke to the role of creativity throughout an emerging 'post-industrial' UK creative economy, more dependent upon knowledge than natural resources or manufacturing skills, and set in a rapidly globalising context.[61] Box 2.1 reproduces the book's Contents page.

In parallel, however, *Creative Britain* also initiated a more workaday 'mapping' of creative industries, defined as comprising 13 creative content sub-sectors, alphabetically: advertising, architecture, art and antiques, computer games, crafts, design, designer fashion, film, music, performing arts, publishing, software and television and radio.

It would be the role of the Government to ensure that these sectors were treated seriously as contributors to the national economy as well as essential to the fabric of the UK's cultural life. From the start the mapping exercise acknowledged that *"there was no historical, and little current, data available"*[62] to support this exercise.

This early tension between high-level statements of vision and problematic quantification of facts has persisted to the present day. In Chapter Three of this manifesto we set out new thinking on data and boundary definitions designed to support a more coherent approach to policy development; in this chapter, we follow the flow of events.

The 1997 manifesto pointed to a bundle of inspirations and motivations for *Creative Britain:*

- A political narrative of 'modernisation', reflected in Tony Blair's re-naming of his party as 'New Labour', committed to a modernised UK economy equal to the demands and opportunities of globalisation. The Department of Heritage was re-branded as the Department for Culture, Media and Sport and invited to collaborate closely with the Department of Trade and Industry (DTI), which would itself be subject to a number of re-badgings in the subsequent 15 years.[63]

- The legacy values of Victorian and Edwardian social and communitarian philosophy, in particular the ideas of William Morris and John Ruskin ('useful beauty') along with Keynes's forthright advocacy for an Arts Council. This provided a policy context for restoring free entry to museums and galleries; along with the diversion of funds from the National Lottery, established in 1994, to create the National Endowment for Science, Technology and the Arts, which Chris Smith said (presciently) would be *"about pulling down the artificial barriers between science, technology and the arts, because in the worlds of the new design techniques and multimedia and digitised images such barriers are becoming meaningless as well as counter-productive."*[64]

- A recognition that rapidly emerging digital communications technologies called for substantial infrastructure investment, along with radically re-designed regulation. In December 2003, Ofcom took the place of five regulators in broadcasting, telecommunications and radio spectrum. Answerable jointly to the DCMS and the DTI, Ofcom's focus would be broadcasting and telecommunications, rather than the Creative Britain project as a whole, though the overlap between Ofcom's mission and the pursuit of Creative Britain would become more obvious in the early years of the new millennium as digital communications technologies became pervasive.

BOX 2.1: Contents page for *Creative Britain,* 1998

1. Cultural Value: the Creative Industries in Britain.
2. Only Connect: Culture and our Sense of Identity.
3. A Vision for the Arts.
4. All the World's a Stage: Culture, Business and Society.
5. The World is Your Oyster: the Information Society and the Role of Public Libraries.
6. Past Present: the importance of World Heritage.
7. In a Great Tradition: The British Music Industry.
8. Making Movies: the State of the UK Film Industry.
9. Pennies from Heaven: Public Broadcasting in the Digital Age.
10. Living in the Real World: Access to Intellectual Property.

11. Design: At the Crossroads of Science and Arts.
12. It Could be You: The Future of the National Lottery.
13. Into the Future: The Millennium and Beyond.
14. Arts and the Man: Culture, Creativity and Social Regeneration.
15. No Wealth but Life: the Importance of Creativity.

2. What about the Internet?

The importance of new communications technologies in the Creative Britain concept was clear from the outset, revealing continuities with earlier paradigms of productivity-fuelled economic regeneration enabled by computers and other electronic devices.[65] From a critical perspective, this modernising fusion of culture and electronics was seen as an *"attempt to capture the current prestige of this theory of innovation... for a sector and a group of workers to whom it does not really apply."*[66]

By 1997, the threat to the broadcasting barons of multi-channel television delivered by new mechanisms, such as cable and satellite, was clear, as was the commitment of liberalising governments around the world to the privatisation of the telecommunications sector. Much less clear, in the pages of *Creative Britain*, was the significance in this unfolding drama of the Internet. Despite clunky dial-up connectivity, there was by March 2000 enough heat to inflate the 'dotcom bubble'. Yet, *Creative Britain's* chapter on the music industry does not mention the Internet, noting that *"the toughest challenge facing the music industry is CD piracy,"* said to be costing globally $5 billion a year in lost physical sales. Lord Smith commended the UK music industry's response to off-line piracy as a *"blue-print for anti-piracy initiatives in other creative industries."*[67] In 1998, peer-to-peer file-sharing was already a fast growing phenomenon and 1999 saw the launch of Napster, which precipitated a response from the American and British music industries which would become a model for how not to respond to business model disruption from the online world.

A similar hesitation with regard to the Internet occurred in the framing of the new Communications Bill. The White Paper heralding this legislation was delivered on the stroke of the new millennium, in December 2000, when politicians and the media were more agitated about the 'millennium bug' than the emergence of the Internet as an alternative global, commercial platform for distributing creative works, along with other goods and services.[68]

Around the same time, Scottish policymakers had identified a somewhat different direction. The publication by Scottish Enterprise in 1998 of *Creativity and Enterprise*[69] took as its starting point the DCMS and *Creative Britain* paradigm, but set out a far more digitally driven vision of the creative industries in which the role of the Internet and enabling software were made explicit. This initial work was further developed with the launch in 2000 of a creative industries strategy for Scotland,[70] which saw digital media as the engine of growth and a focus for investment. Subsequently, Scottish Enterprise's interest and commitment to the creative industries has waxed and waned, suffering from unhelpful tensions between Scottish Enterprise on one side and major cultural organisations (such as the then Scottish Arts Council and Scottish Screen) on the other. The result has been a loss of clear shape in policy. An industry-led 2009 digital media strategy for Scotland, *Digital Inspiration*, was forthright in its focus upon economic opportunities arising from digital

technologies, in contrast to the Scottish Government's current creative industries strategy[71] which makes scant mention of the Internet. It is not easy to identify concrete outcomes from most of this activity.

Northern Ireland came late to the creative industries party, following a stuttering start with early policy statements that did not translate into action.[72] In a *Strategic Action Plan* for the sector in 2008,[73] the transformative impact of the Internet and digital technologies were still conspicuous by their absence. Northern Ireland has a division of responsibilities for creative industries policy between the Department of Culture, Arts and Leisure (DCAL) and the Department of Enterprise, Trade and Industry (DETI) that mirrors the UK split between the DCMS and Department for Business, Innovation & Skills (BIS) (formerly the DTI). However, DCAL's 'lead' role is not as formally established as that of the DCMS (and a recent inquiry by the Committee for Culture, Arts & Leisure calls on it to raise its profile as policy lead for the sector[74]).

Wales commissioned a policy review of creative industries in 2004,[75]. which built upon sectoral approaches to the automotive and aerospace industries, but suffered from a serious absence of data about Welsh creative industries. This review focused on film, television and music, with the intention (never realised) of extending to other parts of the creative industries later. At its heart was a £7 million Creative Intellectual Property Fund, stronger business support and more involvement of industry experts in administering policy towards the creative sector. A subsequent review of Wales' creative industries (led by one of the authors of this manifesto in 2009/10) found the 2004 policy insufficiently attentive towards emerging digital business opportunities across the creative industries generally and *"lacking clarity of strategic purpose."*[76] More recently, Wales has developed an investment fund to support digital business growth and continues the search for an effective way to achieve satisfactory broadband and mobile coverage in a sparsely populated, mountainous country.

Meanwhile in the English regions, the early years of Creative Britain saw some Regional Development Agencies (RDAs) take up the baton of policy thinking for the creative industries, supported by landmark initiatives such as the BBC's move of significant parts of its London–based activities to Salford. Cities such as Bristol and Glasgow were among those that emerged with a reputation for imaginative growth of their creative industries, with a combined focus upon creative businesses, on the one hand, and the subsidised arts on the other. It became routine to identify the creative and digital industries as 'priority' sectors in regional and local industrial policies,[77] not always convincingly so. Following the 2010 election, the RDAs were abolished and budgetary pressure on local authorities led to significant retrenchment in cultural projects. Across the UK, there have been spasmodic attempts to nurture creative clusters of one kind or another; in Chapter Six, we critically evaluate the approaches taken.

3. Ofcom

In 2003, Ofcom represented an ambitious response to the forces shaping media and telecommunications convergence,[78] with a set of powers intricately connected to the governing EU legal framework in telecommunications, audio–visual media and e–commerce. Some, including powerful news media proprietors, thought the new 'super–regulator' had too much power (in the run up to the 2010 General Election, David Cameron proposed radical retrenchment[79]). Others argued that Ofcom needed an even broader mandate, given the speed at which the Internet was changing the face of the media and telecommunications sectors.

For example, film–maker (Lord) David Puttnam, argued that *"Ofcom should have been given more powers, even investigative ones, in relation to emerging technologies,"*[80] but

as the Bill made its way through Parliament print media companies' concern to avoid encroachment of broadcast-style 'over-regulation' of their own activities converged with the views of Internet free speech campaigners to resist anything that smacked of content regulation on the Internet, unless (according to the compromise eventually reached) the service in question was 'television-like'.

Telecommunications companies, as Internet Service Providers (ISPs), were chiefly concerned to ensure that the new regulator focused upon incentivising investment in their burgeoning broadband networks. The Communications Managers Association said a regulatory approach to issues arising from the Internet could wait another decade.[81] These positions reflected legitimate concerns, but they meant that that consideration of the Internet's rapidly emerging importance as an alternative platform for the delivery of content became something of a side issue.

So, Ofcom formally began its operations in 2004 with no mandate, not even a research-based watching brief, with regard to the Internet. By 2004, it should be recalled, Apple was engaged in its potent re-invention; Amazon was a decade old; Google was planning its first stock market public offering and Facebook was the new kid on the block. Whilst it is true that Ofcom's data gathering and research activities today (with no change in legal mandate) have not prevented it from paying attention to the impact of the Internet on the UK's media and telecommunications sectors,[82] even now that work largely has to be justified with reference to legal duties framed in a pre-Internet environment or to concerns arising from Ofcom's more detailed responsibilities with regard to either broadcasting or telecommunications. For example, the 2012 Ofcom Communications Market Report deals for the first time with the important issue of emerging online 'hyperlocal news services';[83] Ofcom justifies this work with reference to its need to deliver competition and plurality assessments of regulated local broadcast media markets.

It is also true, however, that Ofcom had plenty on its plate in 2004. There were complex spectrum auction and utility regulation challenges arising in telecommunications, which would themselves govern the speed at which the UK could acquire a fit for purpose broadband infrastructure. Commercial television needed a new regulatory framework as UK television went officially 'digital,' a process completed only in 2012, by which time the Internet had emerged as a very significant alternative platform for both radio and television, with big implications for Ofcom's core duties with regard to telecommunications regulation and spectrum licensing. We discuss Ofcom's role and related competition issues in Chapter Nine.

4. Nesta, creativity and innovation

As Ofcom made its way from infancy to adolescence, Creative Britain's other children were also coming of age. Nesta, with an initial endowment of £200 million, was in business by 1998, meriting seven references in Chris Smith's *Creative Britain* publication, where it is variously asked to: *"build the bridge between an idea and a product"; "be a National Trust for Talent"; "pull down the artificial barriers between science, technology and the arts"; "turn creativity into products and services which we can exploit in the global market"; and "advance public appreciation of the creative industries, science and technology."*

It is not surprising that with such a sprawling brief, Nesta suffered some blurring of vision. In its first decade it chose to assist individual creative entrepreneurs and businesses through enterprise support and mentoring, but it lacked the authority to influence in any decisive way the digital creative economy issues which are the subject of this manifesto. For example, it played no significant role in the debates that dominated Ofcom's first decade (broadband roll-out and the future of public service television) and it was a bystander in the acrimonious debates about intellectual property which eventually

overwhelmed the *Digital Britain* project of 2008 to 2010. Nesta's authority in creative economy issues, however, has been established in an ambitious research programme in the last decade, providing a renewed opportunity for evidence-based thought leadership following its new role (since 2012) as a free-standing charitable endowment.

But if Nesta's brief was hazy, the education debate was marked by violent self-contradiction. In 1999, Ken Robinson, then Professor of Education at the University of Warwick, was asked to chair a national committee of inquiry into creative and cultural education. His report, *All Our Futures*,[84] argued that creativity should be set alongside literacy and numeracy as a strategic priority at all levels of education. Although Robinson's views have subsequently been in demand all over the world (he is now based in Los Angeles) his own assessment of the UK Government's response to his work is that it was 'marginalised'[85] by a Government in thrall to more basic issues of numeracy and literacy.

In 2006, the Leitch Review of Skills further focused political attention upon numeracy and literacy, maintaining a line of continuity in UK education policy which extends to the current Government's concern about 'essential knowledge,'[86] so ensuring marginalisation for Robinson's creativity agenda. In 2010, the Government's attempt to emulate the International Baccalaureate, the English Baccalaureate, excluded Art and Design & Technology. We address the creative economy education debate more fully in Chapter Eleven of this manifesto.

In 2005, Sir George Cox had delivered (to HM Treasury) his report: *Creativity in Business: Building on the UK's Strengths.* This took a very broad view of the growing place of creativity in many business sectors, including manufacturing, and drew particular attention to the creative needs of small and medium-sized enterprises. The Cox Review specifically highlighted the critical role of design in shaping the relationship between creativity and business. Yet Cox's impact upon policy would also prove elusive as UK policymakers fought shy of developing an innovation system designed to harness and respond to creativity. We consider these issues in greater detail in Chapters Five and Six.

It is difficult to avoid the conclusion that in the early years of the new century, the visionary dynamics of *Creative Britain* were encountering resistance. Education policymakers were not convinced by Robinson's creativity agenda. Business and innovation policymakers did not act upon Cox. This absence of coherent engagement from relevant parts of Whitehall, including the Treasury, would prove debilitating for policy thinking on the creative economy. Ofcom and Nesta, in their different ways and for different reasons, were not in a position to offer the breadth of thinking needed to help guide the UK's strategic response to a digital world where the pace of change was becoming more intense, year after year.

Worse still, as the political momentum behind the creative economy dipped or became more cautious in the UK, it was picking up in other parts of the world. South Korea designed and delivered a world-leading digital infrastructure; Singapore executed an ambitious programme of reform of education, then, along with Israel, IP; Canada introduced a series of aggressive tax measures to attract inward investment to its video games, music, film and publishing sectors; China set itself ambitious creative industries and patent generation goals. Brazil, for a period, embraced open source and Creative Commons. Most important of all, Silicon Valley roared into the world of social media, with the launch of Facebook, as other creative business centres thrived in the US, in places as diverse as New York, North Carolina,[87] Boston[88] and Austin, Texas.

5. Creativity plus electronics

In the UK, these international developments lent weight to calls for a more ambitious approach, but the political and business climate had become more difficult, as the creative industries united around the central priority of defending copyright in the disruptive new setting of booming online markets.

As early as 2001, John Howkins, a prolific and influential UK media business consultant, had deployed the term 'creative economy' in the title of a book with an airport bookstall proposition: *The Creative Economy: How people make money from ideas.* Howkins identified intellectual property reform as a key issue and led the group which drafted the Adelphi Charter on Creativity, Innovation and Intellectual Property in 2005, and which sought to jolt the UK from its gridlocked approach to copyright and other IP issues.[89] In the 2007 revision of his book, Howkins declared: *"The new economy is creativity plus electronics."*[90]

Recognising the need for a government response, in 2005 the Department for Culture, Media and Sport launched its own 'Creative Economy Programme', of which arguably the most substantial output was *Staying Ahead* (2007), a detailed re-assessment of the scale, scope, prospects and policy framework for the UK's creative economy (and co-authored by one of this manifesto's authors).[91] Meanwhile, the Chancellor of the Exchequer, in his pre-Budget report in 2006, published the findings of a review of intellectual property issues, led by Andrew Gowers, a former Editor of the Financial Times.[92]

The Gowers Review concluded that the UK's IP system had historically been a source of strength, but in advancing 54 specific propositions for change, Gowers also recognised the case for a substantial overhaul. In particular, Gowers challenged the UK's creative industries over their relentless campaign for further extensions of copyright protection, supported by ever stronger policing, arguing that current term limits (already extending beyond a century) were already as hard to justify on economic grounds as they were difficult to enforce in the world of global data sharing facilitated by the Internet. (We discuss IP issues in Chapter Ten of this manifesto).

In 2008, another White Paper sought to re-assert a sense of policy coherence, but *Innovation Nation* had nothing beyond lip service to pay to the creative economy.[93] Its institutional focus was on the Technology Strategy Board, newly chiselled from the Business Department, and very closely tied to a science and technology agenda. With an Intellectual Property Office set up as an administrative rather than a policy-shaping body and Ofcom pre-occupied with a complex regulatory load on issues like competition in the Pay Television market, Creative Britain was running out of steam.

6. *Digital Britain*

This was one of a number of voids which the *Digital Britain* project aimed to fill.[94] In June 2007, Gordon Brown had replaced Tony Blair as Leader of the Labour Party and Prime Minister. Stephen Carter, Ofcom's first Chief Executive, was drafted into Number 10 as the PM's Chief of Staff, but the new arrangement did not take. Carter moved over to the House of Lords and a new role as Minister for Technology, Communications and Broadcasting in the Business Department. From there he would direct a *Digital Britain* team drawn mainly from the civil service and Ofcom, but which also co-opted external experts, including Andrew Gowers to guide on intellectual property issues.

Digital Britain expressed a technocratic ambition, which included the re-invigoration of Creative Britain. It set its sights on *"a strategic view of the sector, backed by a programme of action... to support the growth of digital infrastructure... to enable Britain to be a global centre for the creative industries in the digital age";* to ensure that people have the right *"skills to flourish in the digital economy and that all can participate in the digital society"* (and to improve public services) *"through digital procurement and digital delivery."* By the end of 2008, this was presented as a beacon of the new 'industrial activism' to which Prime Minister Brown and his newly appointed Business Secretary Lord (Peter) Mandelson, were committed as part of their response to the economic shock caused by the collapse of Lehman Brothers and the resulting financial crisis.

Prime Minister Brown proclaimed on the first page of the resulting report: *"Only a Digital Britain can unlock the imagination and creativity that will secure for us and our children the highly skilled jobs of the future. Only a Digital Britain will secure the wonders of an information revolution that could transform every part of our lives. Only a Digital Britain will enable us to demonstrate the vision and dynamism that we have to shape the future."*[95]

Beyond this rhetoric, the 60-point summary of conclusions and actions ranged from taxing telephone lines to providing support for investment in Next Generation Broadband through to giving tax breaks for video games developers. The first of 19 Digital Britain propositions also declared that *"the Government believes piracy of intellectual property for profit is theft and will be pursued as such through the criminal law"*, paving the way for legislation to force ISPs to co-operate with an Ofcom-led regime to identify and punish offenders, if necessary by cutting them off from the Internet.[96]

Other recommendations sought to secure the Gowers Review's copyright reforms around access to orphan works and the development of more fluid, legal markets in licensed digital content; the Technology Strategy Board was instructed to start work on a Next Generation Broadband 'test bed' for digital transactions. There were also warm words for the BBC and Channel 4 and some rather innovative thoughts about how to shore up the crumbling base of local news provision in the UK by supporting a network of independently financed, multi-platform news consortia.

But with the election approaching, creative industries lobbyists were at the peak of their capacity to influence. One by one, the three main political parties turned against the proposed Gowers Review copyright reforms and in the process disembowelled that aspect of the project's reforming intent. In 2009, a junior Business Minister, David Lammy, was asked to turn out a new 'copyright strategy,'[97] which confirmed much of the Gowers analysis, but concluded that reform was not needed.[98] As the Government readied itself to push the Digital Economy Bill through Parliament ahead of an election due by May 2010, the press was thick with reports of Government concessions to industry lobbying.[99] Some of the most controversial clauses were dropped and the Digital Economy Act, including its measures to toughen up online enforcement of copyright and allow Ofcom to monitor ISP traffic management practices, hobbled to the statute book.[100]

7. Digital Opportunity: innovation and growth

Prime Minister Brown, of course, lost the election, and less than six months later, Prime Minister Cameron dismayed rights holders by proposing yet another review of intellectual property issues, this one to be focused upon the relationship between IP law and its consequences for innovation and growth. In launching the review, the Prime Minister asked whether the UK needed something more like the American 'Fair Use' defence against copyright infringement, which Google had argued to the Gowers Review was a critical factor in explaining its own success. This review (see Chapter Ten) was led by one of the

authors of this manifesto. It concluded that there was, indeed, a significant growth dividend to be had from a well-evidenced programme of reform, but advised against the embrace of a US-style Fair Use law.[101]

Critics of this latest review have argued that both the Prime Minister's agenda and the review's recommendations are too sympathetic to the arguments for IP reform made by Google and other large American digital businesses. The Coalition Government has, nonetheless, acted upon the Hargreaves Review's findings on IP reform.[102] At the same time, it has opened a public discussion about the contents of a new Communications Bill, which may be needed in some form, if only to update licensing arrangements and to enable UK statute to reflect changes in European law. An open letter published in May 2011[103] anticipated three areas for potential government action:

- Growth, innovation and deregulation *"to make the UK communications and media markets more competitive globally".*
- A communications infrastructure that provides foundations for growth, delivering *"the best superfast broadband network in Europe by 2015, supported by any necessary reform of spectrum allocation arrangements".*
- The right environment for the content industries to thrive *"in order to achieve the right balance between appropriate protection for the public while enabling rapid innovation, better services and sustaining freedom of expression."*[104] (The language here establishing a place-holder for the Government's response to the Leveson Inquiry on the culture, practices and ethics of the press, which would be published in November 2012.)

What was most obviously missing from this list? In short, the Internet or, to put the point another way, the ambition to understand the implications for competition and other regulatory issues of rapidly growing digital markets including the role within them of powerful Internet platforms, such as Google, Amazon and Apple.

Today, governments around the world continue to define and refine policies designed to strengthen their creative economies. Europe's fragmented digital market contrasts with the borderless digital markets of the United States and China. Much can be learned from digital initiatives in places as diverse as Singapore, Estonia and Canada. But the main lesson of this short UK history of the last 15 years is that brisk adaptability to transformative digital technologies is a pre-condition for successful policy design. Policymakers must beware of those forces, such as regulatory capture by powerful established interests, which draw them into paralysis.

It would be wrong, however, to ignore what is going right on the policy front today. The Government, having established a Creative Industries Council,[105] has embraced the case for copyright reform, along with an agenda to promote greater access to public and open data and a more open model in academic publishing. The Council is also supporting important work to improve statistics and measurement and on skills and access to finance. Nesta's *Next Gen* collaboration with Ian Livingstone and Alex Hope has won sufficient support to persuade the Education Secretary to include computer science in the English Baccalaureate. There has been clear digital leadership from a number of important UK institutions, ranging from the Arts and Humanities Research Council and the British Library to the National Theatre and the Open University. The challenge is to shape these initiatives into a coherent and sustainable whole. Our starting point is to go back to basics and ask, as we did in 1997: what is the creative economy?

3 WHAT IS THE CREATIVE ECONOMY?

It is easy to understate the importance of clear definitions and reliable economic statistics to the formation of good policy. Yet, without these tools, policymakers risk missing the most important sources of employment and growth; it becomes much harder to maintain a coherent policy framework, and impossible to track progress. In the UK, the existing creative industries definitions underemphasise the importance of digital businesses, many of whose business models do not revolve around the exploitation of IP. They also neglect fast-growing creative activities that take place outside of the creative industries in the wider economy.

But defining and measuring the creative economy is not straightforward.[106] Not only does it require data to be consistently gathered over time, but the definitions must also be capable of responding to genuine structural shifts in the composition of the creative economy, such as those stemming from digitisation.

In this chapter we describe how, over time, the definitions and metrics used by DCMS have become less able to fulfil this essential function. Inadequate statistics have contributed to a perception in the eyes of some that the creative economy is not a well-defined economic entity that is susceptible to strategic policy interventions. We recommend a way forward, with a statistically robust new methodology for classifying and measuring the creative economy, based on a detailed study of where creative people work, which evidences what is distinctive about the creative industries (namely, their specialised use of creative talent), but also captures the importance of 'embedded' creativity in the wider economy.

1. A brief history of creative industries statistics in the UK

In 1998, the UK Department for Culture, Media and Sport famously defined the creative industries as *"those industries which have their origin in individual creativity, skill and talent and which have the potential for wealth and job creation through the generation and exploitation of intellectual property."*

Based on this, the DCMS Mapping Documents in 1998 and 2001 proposed that 13 sub-sectors made up the creative industries (as listed in Chapter Two). This seminal work became the template for numerous other national studies throughout the world, in high-performing countries like Taiwan, New Zealand, Australia, Singapore[107] and Germany,[108] and at the regional and city level too, e.g. London, Paris and Auckland.[109]

For the UK, these creative industries appeared to form a reasonably coherent group based upon the generation of commercial value by creative talent. Together they comprised one of very few business sectors (with financial services and aerospace), where the UK could plausibly claim to be a world leader.

Independent research lent support to the view that the DCMS's sub-sectors were a coherent grouping: they produced most of the UK's creative products. The official Input-Output tables, which provide detailed information on the supply and use of goods and services in the economy, showed that the creative industries provided as much as 83 per cent of total domestic supply of creative goods and services in 2004.[110]

Labour market statistics further reinforced the view that the creative industries as captured by the DCMS–13 were an economic reality. Analysis of the 2001 UK Household Census and the 2001–2006 Labour Force Surveys showed that the great majority of these sub–sectors were the biggest employers of creative talent.[111]

However, the DCMS's 13 sub–sectors counted amongst them some uncomfortable bedfellows, with a notable split between household–facing sub–sectors like music, film and performing arts and business–facing sectors like advertising, design and software. Software in particular turned out to be controversial because it did not sit easily with the artistic or aesthetic dimension which many believed was the essence of creative industries.[112]

There were also a good many caveats and limitations in the DCMS Mapping Documents. These variously concerned overreach, gaps, lack of comparability across sub–sectors (in particular, inconsistencies in data sources and classifications), and insufficient granularity (the reliance on highly aggregated source data).[113]

The annual DCMS Creative Industries Economic Estimates,[114] first released in 2002, attempted to address some of these inconsistencies, at least for the sub–sectors which could be identified using the official Standard Industrial Classification (SIC) codes, by producing each year the same headline statistics on Gross Value Added (GVA), employment, net exports and the number of creative businesses, based on consistent data sources for each sub–sector. These headline statistics showed that the UK's creative industries were growing at twice the rate of other sectors, helping to raise the profile of the creative industries (both in the UK and internationally).[115]

Yet, a great many challenges remained in the DCMS statistics, as a result of the limitations of the SIC codes, which are set in conjunction with the UN's industrial classification system for the purposes of international consistency and which are reviewed only at ten–year intervals, and a low level of investment in the statistics by successive governments.[116]

Partly because of this (but also because they had different data needs) sector bodies such as UK Music, the (now defunct) UK Film Council, the British Fashion Council and the Crafts Council started producing their own sector–specific economic statistics, along with equivalent bodies across the devolved nations and the English regions. Inconsistent treatments of sectoral boundaries (what should be included and what should not) led to a plethora of non–comparable estimates. The result was an ever–increasing landscape of sectoral, national and regional statistics that purported to measure similar things.[117]

To make things worse, in December 2011 the DCMS removed two software–related occupations and industries from its classifications, slicing off in one fell swoop £25.9 billion that the creative industries had previously been estimated to contribute to the UK's GVA. This unfortunate decision betrayed a lack of appreciation of the interconnected role that software and creative content plays even in non–software businesses, a point we return to below. Meanwhile, a 2012 economic impact study by Creative Scotland argued for the inclusion of software.[118]

Such confusion weakens the standing of the creative industries in the eyes of mainstream UK economic policymakers, and in particular HM Treasury.[119] The work of key agencies like the Office for National Statistics has also remained strangely disconnected from the creative industries, even as BIS and the DCMS promoted the creative industries as a high–growth sector.[120] The UK Government has not played a sufficiently energetic role in international efforts to coordinate the production of internationally comparable statistics, such as UNESCO's or Eurostat's ESSnet Cultural Statistics Frameworks.[121]

2. A dynamic mapping of the UK's creative industries

The DCMS has never published a methodology by which it determines which sub-sectors are deemed 'creative' and which are not. Without this, it is no surprise that the way we think about the creative industries in statistical terms has not adapted well to the emergence of entirely new forms of creative business made possible by digital technologies.

In order to address these issues, we have worked with researchers Alan Freeman and Peter Higgs at the Queensland University of Technology to develop a methodology that is explicit about those features which make an industry creative, and then measures those features in order to identify the creative industries.[122] We show that a defining characteristic is their especially intensive use of creative talent.

Our starting assumption is that creative talent is different from other types of labour in that it helps give the organisations that employ it the capacity to offer differentiation in their products; to cater precisely for the discretionary requirements from ever more demanding groups of consumers and business clients. What characterises genuine creativity is not the production of large, standardised volumes at low costs, but what is in effect a continuous succession of smaller runs of products each varying from its predecessors and competitive offerings. These points of differentiation may be small, but they are sufficiently valued by customers to attract their loyalty. This helps explain why bestselling products in markets as diverse as books, music (and, outside the creative industries, pharmaceuticals) are characterised by high and increasing rates of churn.[123] It is creative talent that has enabled these creative businesses, much more so than businesses in other industries, to respond to the needs and desires of their customers and to reach new markets.

Core to our understanding of this creative talent is that it has an appreciation of what 'kind' of effect is desired, but it is not told how to produce that effect in the same way that, say, an assembly line worker or many skilled technicians or engineers are instructed. The creativity consists in devising an original way of achieving an effect that is not expressed in precise terms (or in any terms at all in the case of open-ended creativity).[124]

This confers an important quality on creative talent, namely that it is difficult, if not impossible, to fully mechanise the creative process and hence to substitute machines or devices for humans. Mere implementation of a creative decision is not in this sense a creative role, but making one is.

Technology has largely done away with the need for the highly skilled roles of typesetters and photo touch-up artists, for example. The former is now subsumed into the page management applications and style guides applied by art directors and graphic designers. The continual process of democratisation of technology lowers the cost and the technical skill needed to do previously highly complex, yet no longer creative, tasks. Creative professionals adopt, adapt and absorb new technologies in pursuit of creative excellence, but they are seldom made wholly redundant by it.

The product differentiation that characterises the creative industries and their talent is also reflected in their distinctive production processes, described by writers such as Richard Caves.[125] Foremost amongst these are very high levels of flexible collaboration and project-based work[126] (Caves's 'motley crew' property), the existence of pre-market or 'gatekeeper' selection mechanisms (galleries, agents, distributors, publishers etc.), contracts that manage uncertainty rather than risk (the 'nobody knows' principle) and so on. A final important characteristic is the strong tendency towards geographical clustering at a local level,[127] which we discuss in Chapter Six, leading to phenomena such as Soho's post-production cluster, East Scotland's games hub, Brighton's Fuse and Shoreditch's Tech City.

These considerations inform an economic model of the creative industries, with its own characteristic inputs, outputs and production processes. They also give rise to a definition of a 'creative occupation' as:

> *"a role within the creative process that brings cognitive skills to bear to bring about differentiation to yield either novel, or significantly enhanced products whose final form is not fully specified in advance."*

In research undertaken for this manifesto, this definition is used to specify five creativity criteria with which to score all the Standard Occupational Classification (SOC) Codes in the UK workforce. These are:

1. Novel process – does the role most commonly solve a problem or achieve a goal, even one that has been established by others, in novel ways?

2. Mechanisation–resistant – does the role contribute something for which there is no mechanical substitute?

3. Non–repetitiveness or non–uniform function – does the work vary because of the interplay of factors, skills, creative impulse and learning?

4. Creative contribution to the value chain – is the outcome of the occupation novel or creative irrespective of the context in which it is produced?

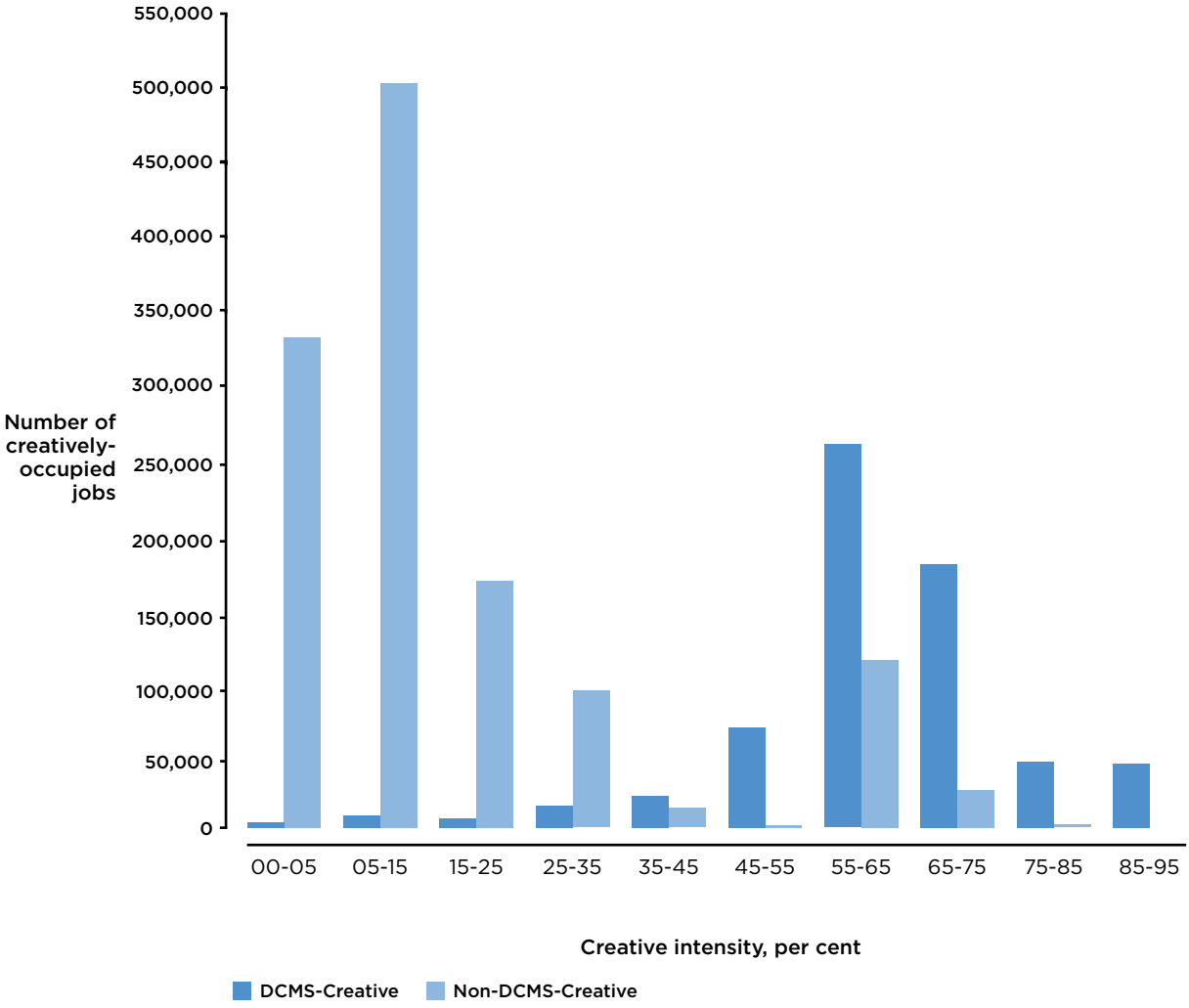
5. Interpretation, not mere transformation – does the role do more than merely 'shift' the service or artefact's form, place or time?

Of course, each of these five criteria is problematic when considered in isolation, and they do not offer hard and fast rules for determining when an occupation is or is not 'creative'. There are also deep connections between them: it is unlikely that the activities of someone who is constantly called on to devise new processes, to carry out new transformations and to construct creative interpretations of raw material can easily be mechanised. Nonetheless, occupations which score positively on all or most of the indicators are very likely to function as an economic resource that the creative industries require.[128]

Occupational scores are then used to calculate a 'creative intensity' for each SIC industrial code. This creative intensity measures the percentage of the workforce in the SIC code that is accounted for by workers in creative occupations. Figure 3.1 presents the distribution of employment (y–axis) across sectors with different levels of creative intensity (x–axis), highlighting whether or not they are classified as 'creative' in the DCMS's current classification.

The first striking thing it shows is how a group of industries (towards the right end of the figure) are distinguished by a markedly higher tendency to employ creative workers than other industries. Secondly, it shows that very large numbers of creatively–occupied workers – the majority in fact – work outside the creative industries (the lighter columns add up to more than the darker columns). Thirdly, it suggests that there are serious misallocations in the current DCMS classifications; this includes a definite group of industries, which DCMS does not treat as creative, but which appear in the range 55–65 per cent as a 'blip' in the non–creative distribution (the fourth lighter column from the right), including 'Computer programming activities' (62.01) and 'Computer consultancy activities' (62.02) – the two SIC codes that DCMS dropped in 2011 – which between them in 2010 accounted for over 400,000 people.[129] 'Other information technology and computer service activities' (62.09), with a creative intensity of 36 per cent, employs a further 35,000 people.

Figure 3.1: Distribution of creative employment by creative intensity of SIC codes, partitioned into DCMS and non-DCMS



The research further shows that the integrity of the creative industries – the most specialised employers of creative talent – as an economically coherent grouping is in fact badly damaged if software workers are excluded from the list of creative occupations used to generate the estimates of creative intensity. While in that scenario an industry like 'Computer programming activities' (62.01) retains its relatively high level of creative intensity, indicating that it is a major employer of non-software creative professionals, others like 'Manufacture of consumer electronics' (26.40) – which few would consider a creative industry – now emerge as relatively 'creative' on the basis of their creative intensities too. This suggests that it is the combination of workforce creative skills across a spectrum of activities – with software as a core skill – which contributes to the 'creative industries' as a coherent grouping of sub-sectors. Or more generally, that digital technologies, and the opportunities they open up for creative activity, tend to complement other non-technology creative skills.

What these results suggest is that there is a distinctive set of industries – the creative industries – which share a common feature: they are disproportionately significant employers of creative talent.[130] But they also highlight the huge significance of creative

employment outside the creative industries. In this sense, we both agree and take issue with exceptionalist critiques that creative markets cannot by their nature easily fit into industrial frameworks.[131] The creative economy is indeed complex, socially networked and *"to a large extent an outgrowth of the previously non-market economy of cultural public goods and private imagination".* But the results show that they can still be measured, insofar as occupational classifications permit us to track where creative people work, and on that basis a distinctive set of creative industries, set within a broader creative economy, can be clearly identified in the data.

3. Digital technologies and creativity

If we think about the shape of the creative industries today, we should not be surprised to find digital technologies at their heart (see Box 3.1).[132] Today, social networks, search engines and other digital platforms help to generate new products and services which rely upon highly creative talent (including the contributions of users).[133] We also know that many 'digitally native' companies are deeply integrated into creative industries value chains – another indication that they rightfully belong in the creative industries.[134, 135] We see this at all levels – from production, where digital tools are transforming the creative process, to distribution (with new platforms) and consumption (devices); we explore these issues in more detail in Chapter Four.

The inclusion of these digital creative activities in the frame of the creative economy also challenges the preoccupation of the existing DCMS definitions with businesses that generate and exploit intellectual property (IP). IP is of course central to the value added in many creative industries, but significant elements of the creative industries use (or provide inputs for) business models such as online advertising that do not directly rely on exploitation of IP.[136] In fact, sectors like fashion design and advertising showed long before the digital revolution that creative businesses can in some cases thrive on competitive strategies like first mover advantage in which IP plays less of an obvious role.[137]

4. So how big is the creative economy?

The new estimates suggest that in 2010, as many as 59 per cent of creatively-occupied workers in the UK worked outside of the creative industries as we have identified them.[138, 139] Table 3.1 also suggests that 2,495,700 (or 8.7 per cent of the UK labour force) worked in the creative economy (that is, 1,932,400 + 563,300). Of this almost 2.5 million-strong workforce, the creative industries employed 1,357,300 workers (4.7 per cent of the UK workforce). These numbers suggest that in its 2011 Statistical Release, the DCMS understated the size of the creative economy by almost one million employees, of which almost half falls within the creative industries.[140]

BOX 3.1: The digital face of the creative industries

One of the authors of this manifesto is involved in an AHRC-funded research project called 'Brighton Fuse', which seeks to measure the economic significance of the Creative, Digital and IT Brighton cluster. As part of their work, Fuse researchers have identified over 1,500 creative and digital media businesses in Brighton, and have used these companies' SIC codes to study the extent to which the current DCMS industrial classifications cover the sector. Only just over one quarter (27.2 per cent) of them are covered by the DCMS's classification. Reintroducing the two software-related SIC codes that were dropped in December 2011 would alone bring that up to 42.5 per cent. If we also considered 62.09 ('Other information technology and computer service activities'), which as we pointed out also has a very high creative intensity, the coverage would reach 56.5 per cent of the cluster – twice as big as what is covered by the DCMS classification.

The Fuse team also surveyed around one-third of all digital media companies in Brighton, including detailed questions on the commercial activities of respondents. When we look at the activities of the 60 respondents in the two software-related SIC codes dropped by DCMS, we find video games studios, web designers and developers, social network marketing companies, and digital agencies which combine technology and design capabilities to offer advertising and marketing services, and even BAFTA nominees. Interestingly, 22 per cent of these businesses were started by Arts and Humanities and Design graduates, and 40 per cent see themselves as part of Brighton's 'artistic and creative community' – all of which, to our mind, makes them convincing candidates for inclusion in any meaningful classification of the creative industries.

We have separately looked at a recent list of 'Top European Start-ups' compiled by the Daily Telegraph, and explored what are the primary SIC codes for UK companies that appear in their 'Advertising and Marketing', 'Audio and Media', 'Gaming and Virtual Worlds', and 'Social Networking and Collaboration' categories – that is, those that many would argue are part of the creative industries. In this case, we find that only three out of the 22 start-ups listed would be captured by the DCMS's current classification of the creative industries (note that some of these are included in catch all categories like 'Other Business Support Service Activities not elsewhere classified'; in most cases it is difficult for statisticians to do anything with these businesses until new industrial codes are agreed through the ten-yearly international cycle by which the SIC codes are set).

Sources:

AHRC Brighton Fuse project. http://www.brightonfuse.com/

Daily Telegraph Start-Up 100 http://www.telegraph.co.uk/technology/technology-startup100/8428665/Start-Up-100-the-class-of-2011.html

Table 3.1: Creative Economy Employment, 2010

	Creative industries	Non-creative industries	All industries
Creatively-occupied jobs	Specialists 794,000	Embedded 1,138,400	Creatively-occupied jobs 1,932,400
Other jobs	Support 563,300	Non-creative 26,178,900	Non creatively-occupied jobs 26,742,200
All occupations	Working in the creative industries 1,357,300	Working outside the creative industries 27,317,300	Total workforce 28,674,600

Source: Bakhshi, Freeman and Higgs (2013), using SIC 2007 and SOC 2000 classifications for consistency with DCMS's latest published Creative Industries Economic Estimates.

The estimates suggest that the UK's creative economy workforce grew at over four times the workforce as a whole in the 2004–2010 period.[141] The clear conclusion is that those who have drawn attention to the high growth rates of the UK's creative economy, in the face of accusations of boosterism,[142] are in fact right.

In value added terms, we further estimate that in 2010 the creative industries accounted for 5.3 per cent of UK GVA (which, together with the 4.7 per cent of the UK workforce, suggests that labour productivity is on average higher in the creative industries than in the rest of the economy).[143]

Estimating GVA in the creative economy is less straightforward, as estimates of the GVA contribution of workers in creative occupations (or of any workers in fact) are not published by the ONS.[144] In their absence, we infer an indicative estimate by taking the creative intensities for each four-digit SIC code outside of the creative industries in the economy and multiplying them by the corresponding GVA value for that four-digit SIC code.[145] We sum the resulting numbers to give an estimate of the overall GVA contribution of creative workers outside the creative industries,[146] and then add this back to the 5.3 per cent of GVA contribution of the creative industries to give a creative economy estimate of 9.7 per cent of the economy.[147]

5. New definitions

Our analysis of creative employment in different sectors of the economy, and the argument that the creative industries are highly specialised users of creative workers, points to a renewed focus on creative talent in the creative industry definitions. It also supports the view that the UK economy is one where digital technologies have given rise to a new class of businesses that are some of the most creative on this measure and also make use of software talent. Furthermore, we have noted that like advertising and fashion design businesses before them, many of these businesses rely upon business models that do not rely fundamentally upon the exploitation of intellectual property. With all this in mind we propose a modification to the DCMS's original definition so that it comprises:[148]

> *"those sectors which specialise in the use of creative talent for commercial purposes"*

and an allied definition of the creative economy:

> *"those economic activities which involve the use of creative talent for commercial purposes"*

These definitions have the merit of simplicity and involve only one bottomless item of complexity: the word creativity, the definition of which policymakers and academics will surely debate for the rest of time, but which this chapter has argued can be operationalised for measurement purposes.[149]

The dropping of the reference within the creative industries definition to IP may be seen by some as a retreat from commitment to the importance of copyright, patents and trademarks, but that is not so. The IP framework plays a central role in the generation of value added for many creative businesses, and it is essential therefore that such businesses are covered by the metrics. But by overstating the centrality of IP, we risk neglecting other, fast growing creative businesses and distorting our approach to policymaking across the creative economy.

PROPOSAL ONE

The Government should adopt our proposed new definitions of the creative industries and the wider creative economy. These are simple, robust and recognise the central role of digital technologies.

4 CREATIVE TECHNOLOGIES AND MARKETS

1. Our digital present

In the previous chapter, we studied employment patterns to show that digital technologies and creativity work in tandem and that it makes no sense to separate the creative use of digital technologies from other creative work. This chapter sheds further light on this relationship through the prism of the digital innovations that are transforming creative markets. In doing so, we provide a context for assessing in Chapter Five the competitive situation of the UK's creative economy, and for identifying those areas where UK policymakers should focus if they want to support growth.

Perhaps music provides the starkest illustration of a creative industry that has been disrupted by information and communication technologies. In 1998, when DCMS first defined the creative industries, Cher was at the top of the UK singles chart, and The Corrs dominated albums sales. Music was mostly recorded in expensive studios, reviewed in Smash Hits, the New Musical Express and Melody Maker, promoted on the radio, MTV and Top of the Pops, and sold in the form of shrink-wrapped CDs in HMV, Virgin and a legion of independent stores, to be played on a home stereo system or portable Discman.

Fast forwarding to today, easy-to-use software applications like Audacity and GarageBand are helping millions record and edit music. Audiences discover and spread the word about it through social media, video sites and music blogs. They purchase it in MP3 format in online music stores or stream it from services like Spotify, and listen to it on portable music devices and smart phones that can store hundreds of albums. 2012's biggest popular music phenomenon was Korean pop star Psy, whose hit Gangnam Style received a billion views on YouTube.

To be sure, several major record labels are still in business (although they have gone from six at the beginning of 1998 to half that number now), but their control over the value chain has become less assured, as they have been joined by new Internet players such as Apple, Amazon, Facebook and Google, and smaller entrepreneurial start-ups like SoundCloud and Bandcamp.

While specialist music retailers have all but vanished from the high street, the Internet is bustling with digital services providing legal access to music – over 70 in the UK alone.[150] Many innovative independent record labels are thriving too. The UK's best-selling artist in 2011, Adele, is signed to XL, an indie stalwart. Beggars Group has doubled its annual gross profit since 1998, and now generates 22 per cent of its digital revenues from streaming through sites like YouTube and Vevo.[151] Warp Records has gone from strength to strength, expanding into digital distribution through Warpmart, as well as into film and TV production. No part of the music industry value chain remains untouched by digitisation.

What is true for music also applies in varying degrees to other creative industries, whether they provide content or services to their customers. Amazon already sells more e-books than paperbacks. Advertisers spend more money online than they do offline. Broadcasters operate digital streaming services that can be accessed on computers, smart phones, tablets and video games consoles. Even industries like fashion, which trade in physical

goods rather than bits, are being transformed by blogging, along with image-sharing and e-commerce sites like ASOS and Etsy. The advent of affordable 3D printers and digital platforms for the distribution of product blueprints promises to bring the same disruption to product design that we have already seen in music and publishing, disturbing creative sectors like crafts[152] as well as manufacturing value chains.

This rapid change raises important questions: What are the drivers of these digital transformations? Will they continue? What are the sources of value in digital creative markets? We need to make sense of the evolving landscape in order to assess the readiness of the UK's creative economy to harness new growth opportunities, and the fitness of the policy framework which aims to help it to do so.

In this chapter, we draw on an assessment of market and technology trends that we commissioned from consultants MTM London to inform our work[153] and the academic literature to address these important questions. We begin by examining the technological trajectories driving the evolution of the markets where UK's creative businesses increasingly compete.

2. Technology: layers and trajectories

The information and communication technologies that have so transformed the UK's creative economy are sometimes described as a 'stack', composed of layers – hardware, software, networks and platforms.[154] Hardware is the physical embodiment of these technologies – silicon chips, screens, memory, batteries and input/output devices. Software is the set of instructions that enables hardware to manipulate data to achieve a purpose. Networks are the copper and fibre optic cables and wireless transceivers that machines (and their users) in different locations use to communicate with each other. Platforms combine hardware, software and networks to provide the foundation on which other products or services can be built, bought and sold – the Internet being the most obvious example.[155] Others include the Windows Operating System, Apple's iTunes and eBay's PayPal.

Information and communication technologies have in the past experienced a sustained trajectory of improvement underpinned by progress at all levels of this stack:

I. The processing power of hardware has grown apace with Moore's Law, according to which the number of transistors that can be placed inexpensively on an integrated circuit doubles approximately every two years. It is projected that by 2022, microprocessors in consumer devices will have 50–100 times more processing power than they do today.[156]

II. Software development has become more efficient as a consequence of innovations such as: object-oriented programming (which makes the 'objects' that compose a software program modular, and thus easier to reuse across products and services); new development methodologies such as 'agile' and the 'lean start-up' model, and the large volume of software code developed by global communities of volunteer programmers who release it with open source licences allowing anyone to download it freely, use it and improve it.[157]

III. Networks are acquiring users (whose devices are nodes), density (the number of connections between nodes), and capacity (ability to transfer data across those connections). This is true of fixed-line Internet – with the advent of superfast broadband, which is now available to the majority of UK households – as well as mobile broadband which, in its Fourth Generation, is projected to reach speeds of 100 Megabits per Second and more.

IV. Platforms are able to benefit from the lower costs and higher performance achievable through innovations that involve combinations of components across the technology stack. Examples of such innovative re-combinations include: Microsoft's Kinect (integrating a motion sensor device, 3D camera, body tracking and voice recognition software); Apple's Siri personal assistant; the Raspberry Pi educational single-board computer; and the 'Thingiverse' Internet Marketplace for object blueprints reproducible in 3D printers. The Internet of Things that connects 'intelligent' devices in networks of automation for activities such as logistics or manufacturing is perhaps the ultimate example of an emerging platform made possible by radical progress in hardware, software and networks.[158]

3. The impacts: lower barriers to entry in creative markets

This sustained trajectory of improvement in all layers of the technology stack, and the combinatorial innovations that it has made possible, has lowered the barriers to entry to creative markets.

We see this in all stages of the creative value chain: in the area of content creation, for example, cheap (and in some cases even free) tools like Audacity (for music editing), Unity 3D (for games) and Blender (for animation) have reduced the costs of producing professional quality-grade content; in distribution, a myriad of websites, services and platforms magnify audience reach and marketing opportunities. Collaboration tools and crowdfunding sites have lowered the costs of finding potential partners and funders, even when they are on the other side of the globe. Cloud computing services such as Amazon S3 lower the start-up costs for entrepreneurs who can now scale up their computing capacity as market demand grows, reducing their operating costs by as much as 90 per cent according to venture capitalist Mark Suster.[159]

BOX 4.1: Platform openness

All Internet platforms share one important feature: they provide a foundation to build and deliver, possibly for money, other products or services. Our definition of a platform emphasises its 'unfinished' aspects – that is, the fact that it can be extended – but it does not prescribe what the extension entails, which may be provision of goods or services as with e-commerce sites, applications in the case of Operating Systems, or user-generated content in social networks. Our definition is also agnostic about who does the augmenting – it could be the platform owners, third parties or a mix of both. The design of this mix, and its governance – in particular how 'open' or 'closed' a platform is – are central aspects of a platform's competitive strategy and business model.

Open platforms allow a great deal of access for users, content and application providers, in some cases through open standards that make it easy to develop services, devices and applications which are compatible with them, as well as open application interfaces that facilitate the exchange of data. Closed platforms are more tightly managed by their owners – for example in terms of the technical and administrative requirements for participants to use them.

During the 'Operating Systems Wars' of the 1980s and 1990s, the personal computer (PC) was presented as an open platform because it was easier to target by third party developers of applications, and manufacturers of hardware and peripherals, in contrast to Apple's Macintosh. Today, we see similar differences between the open and even uncontrolled App environment for Google's Android operating system

and Apple's carefully curated App Store, and between the open PC games platform (that can be freely targeted by any developer) and the 'walled gardens' of video games consoles (that can only be targeted by those who purchase an expensive development kit from the platform owners, and pay them royalties on each sale). Platform openness can also refer to user access – in this respect, Wikipedia is an open access platform, while Encyclopaedia Britannica is a closed one.

There are several trade-offs between openness and closure in Internet platforms – for their owners as well as the suppliers of complementary programs and content. Open platforms are usually associated with more experimentation, innovation and competition because entrepreneurs do not need to get permission from the platform owner to launch a new product or service there. Openness has its downsides though – it can attract malicious developers and users, lead to an excess supply of low quality content (as happened in the 'video games crash of 1983', when an avalanche of inferior games for Atari's openly accessible console led to a collapse in the market) (Boudreau and Hagiu, 2008), and create usability problems that prevent a platform from achieving mass adoption (this has been a perennial barrier for open source platforms like GNU/Linux which are popular with tech savvy users, but not with the mass market).

Sources:

Shapiro, C. and Varian, H. (1999) 'Information Rules; A Strategic Guide to the Network Economy.' Harvard, MA: Harvard Business School Press; Zittrain, J. (2006) The Generative Internet. Harvard Law Review. '119: 1974–2039; Veugelers, R. (2012) 'New ICT Sectors: Platforms for European Growth?' Boudreau, K., & Hagiu, A. (2008). Platform rules: Multi-sided platforms as regulators. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1269966

As a result of all this, we have seen a vast increase in the supply of creative goods and services, and also a diversification in the supply base, which now goes beyond 'for-profit' businesses and start-ups to also involve countless new forms of small-scale producers, user innovators and user content generators, 'produsers'[160] and creative citizens.[161]

Amateurs, hobbyists and fans can now, for example, use the Internet to reach hyper local as well as global audiences.[162] YouTube users upload nearly an hour of video every second.[163] There are currently around 60 million sites in blog publishing site Wordpress.[164] And communities of 'modders' create thousands of custom levels for video games such as *Minecraft* and *Left For Dead*.[165] While the fruits of many of these creative experiments will only be enjoyed by their creator's friends and family, some represent the beginning of a career in the creative economy. Or even the path to stardom in cases like singer Justin Bieber, who achieved global recognition on YouTube; E.L. James's *50 Shades of Grey*, which started as an online exercise in 'Fan Fiction'; or Londoner Jamal Edwards, whose YouTube channel SB.TV has more than 11 million views, and who was ranked 42 in the Sunday Times Young Rich List.[166]

Open source communities have for their part developed the GNU/Linux Operating System at the heart of the Android platform, the Firefox browser and the Apache Server software, which currently powers 60 per cent of the world's servers.[167] The 'Maker' movement is applying the open source ethos to the design and production of physical goods.[168] More problematically, users have also taken to distributing copyrighted content through filesharing networks, an issue which we consider in Chapter Ten.

4. Internet platforms and the attention problem

The proliferation of digital content and services that we describe has produced what some refer to as an 'information overload' or 'content glut', that strains the attention of consumers and users, making it hard for them to find what they are looking for, and for creative businesses to secure an audience or user–base for (or an income from) their work. With the content avalanche also come hazards for users, including the malicious – scams, spam and trolls – as well as purveyors of illegal and shoddy goods and services.[169]

The multiplication of web media outlets and the general decrease in audience loyalty towards single sites have, for their part, made it hard for advertisers to measure the effectiveness of traditional campaigns (for all they know, their adverts could be reaching the same individuals as they browse across different sites).[170]

In the language of economics, the increase in the supply of information brought about by digital technologies and the Internet has not always lowered the transaction costs for consumers and content suppliers, with advertisers caught in the middle.

Some of the world's most profitable corporations today are in the business of solving this problem. They have done so by diminishing or removing transaction costs through websites that match consumers to relevant information in innovative ways, whilst simultaneously helping advertisers reach these consumers (thus sometimes described as serving two-sided markets). Google built its search engine atop the hyperlinked pattern of the world wide web, and has used the data it generates to target adverts more accurately. Apple has put in place a seamless, secure and, for many people, beautiful ecosystem of hardware (iDevices and computers) and software (iTunes and the App Store) for the distribution of music and video content and software apps. Valve has done something similar with PC Games through Steam. Amazon and Netflix have used data from consumers' past behaviours to build powerful recommendation engines. Facebook's new Graph Search feature promises to make it easy for people to source information from their friends – and provides a market research tool for brands and advertisers at the same time.

There has also been a proliferation of sites matching suppliers and buyers of knowledge and creative services. These generally use a crowdsourcing model where clients ('seekers') set 'challenges' that they use to find the best suppliers ('solvers'). We see this in TopCoder, which brings together software programmers and clients, 99 Designs, which does the same for graphic designers, and Poptent with its video content for adverts.[171]

All these websites and platforms benefit from network effects. That is, as more participants (users or suppliers) join them, their attractiveness to other participants increases. This creates a virtuous circle. Think of how a popular platform such as the iPhone attracts App developers looking to target large markets, while at the same time the rich catalogue of Apps that these companies offer brings in more consumers. Another important implication of these network effects is that they can result in the opportunity for the abuse of market power. We explore this in more detail in Chapter Nine.

5. Long Tails and Fat Heads

In principle, an online supplier's ability to offer a repertoire of content or services is not constrained by storage and logistics as is the case with bricks and mortar stores – compare, say, the 26 million songs on the iTunes Store in 2012 with the catalogue available in any record shop.[172] This is true to an even larger extent in online marketplaces like eBay or Etsy, the e–commerce site for crafts, jewellery and vintage goods which in December 2012 listed 2.36 million items for sale.[173]

The ability of such sites to aggregate consumer demand globally via the Internet also reduces the opportunity costs of stocking 'niche' offerings. For example, fans of 'retro' adventure games in the vein of 'Broken Sword' created by famed UK developer Charles Cecil perhaps amount to a handful in any particular town, and this makes it uneconomical for the local store to sell those games. However, when those fans are aggregated across the world, for example at Apple's App Store, demand can become very substantial: the iOS version of Broken Sword was in fact downloaded four million times in 2011.[174]

All of this means that digital platforms can now offer a 'long tail' of niche products which, according to journalist Chris Anderson (who coined the term in 2004), accounts for a large and growing proportion of their sales.[175] A study by US economists using 2008 book sales data from Amazon estimates that niche books accounted for 36.7 per cent of overall revenues and contributed as much as $5 billion to consumer surplus.[176] Anderson further argues that *"most successful businesses on the Internet are about aggregating the long tail in one way or another. Google, for instance, makes most of its money off small advertisers (the long tail of advertising), and eBay is mostly tail as well."*

Empirical studies, however, show that the majority of companies 'living in the long tail' fail to generate any sales at all.[177] In fact, the long tail has been connected to a decline in demand for productions lacking large ('triple A') production and marketing budgets; media consultants Oliver & Ohlbaum Associates refer to this situation as 'the Sagging Middle.'[178] Several empirical studies of the distribution of sales in the US home video market, and more recently, video rental and streaming service Netflix, lend support to this view.[179]

We also see this situation playing out within Internet platforms in the form of 'congestion'. Companies in marketplaces such as the Apple App Store have trouble standing out above the crowd. When they do, their innovative ideas are often 'cloned' by copycat developers, a behaviour that has resulted in several lawsuits, and is now being punished by some companies, including Apple. In games, consumers have started migrating to platforms with a 'longer tail' such as online and mobile games, but mid–tier developers in games consoles and PCs have suffered.[180] Almost 50 per cent of creative and digital media companies in content sectors like film, TV, music and video games responding to a survey carried out as part of the AHRC's Brighton Fuse research reported that 'excessive competition in the market' is a substantial barrier to growing their business.[181]

Meanwhile, the commercial 'superstars' in the 'fat head' of the creative economy are reaping the benefits from the expanded reach and ability to engage consumers that the Internet affords them. Lady Gaga has almost 30 million followers on Twitter, while J.K. Rowling has 'Pottermore', a website to sell digital books directly to her millions of fans. As of May 2012, users of the last instalment of Activision's blockbusting 'Call of Duty' games franchise had collectively logged 1.6 billion hours of online play. Venerable arts and cultural institutions are also using digital technologies to grow their 'virtual capacity.' For example, over ten million tickets for high–definition live broadcasts from the New York Metropolitan Opera House have been sold since the series started in 2006.[182]

6. The imperative for business model innovation

The transformations in supply and access brought about by the Internet have also produced a surge of experimentation with business models – that is, in the strategies through which creative businesses seek to generate and capture value, something that starts by being found by audiences.

In that respect, creative businesses are drawing on the Internet's social infrastructure to implement innovations in marketing – such as 'viral campaigns' designed to diffuse rapidly through social networks. *The Blair Witch Project, The Dark Knight* and *Cloverfield* have become iconic examples of viral film marketing campaigns. Creative businesses

are also nurturing loyal user communities that provide feedback, user testing, new ideas and valuable user-generated content. For example, Icelandic games company CCCP has established a democratically elected 'Council of Stellar Management' to steer the development of its game EVE Online.[183] In some cases, users are enjoying some of the monetary benefits too. In 2012, YouTube generated an income for more than one million of its users, and is actively seeking to increase the professional quality of the content they provide.[184]

Creative businesses are also innovating in their pricing strategies, including 'Freemium', where a business provides free access to a 'sampler' or a 'no frills' version of a good or service for consumers who are then given the option of paying for 'premium' features (such as 'virtual items', extra content, professional features, more storage space and so on).[185] This helps creative businesses overcome the 'information paradox' that consumers can only work out their willingness to pay for information products when they've consumed them.[186] The 'metered' paywalls being adopted by an increasing number of newspapers, where users are only charged after going over a threshold of free articles, are a good example of this. The New York Times, a leader in the adoption of this model, reached 450,000 subscribers in 2012, generating for the first time more revenue from its circulation than via adverts.[187] The Financial Times now has more paying digital subscribers than purchasers of its newsprint editions,[188] but its advertising base still relies disproportionately heavily upon print advertising, whose benefits to advertisers are, at this point, better understood.

Another advantage of Freemium over traditional pricing models is that it can help creative businesses segment consumers depending on how much they are willing to pay, and charge them accordingly, thus avoiding a situation where they 'leave money on the table.'

Other pricing innovations include: Google's use of auctions to set the prices of keywords for advertisers; crowdsourcing platforms for services (where the client sets the price and quality for a product, and competing suppliers – say, graphic designers – adjust their costs to deliver it); and even markets for the financing of creative projects such as the successful crowdfunding platform Kickstarter.

The tried and tested 'razor and razorblades' approach is also helping creative businesses generate revenues in an environment where the costs of reproducing content are converging towards zero. Such content can in effect be cross-subsidised to drum up demand for a complementary product or service where the seller makes the bulk of their profits. This is what Apple does with iTunes and the App Store (supplying affordable digital content that drive sales of its iDevices), what Amazon does with its Kindle family of portable devices (which are sold cheaply to increase demand for media purchased through Amazon.com), and what TED does with its streamed talks (which increase demand for its live events).

Another feature of the Internet that creative companies, like others, are using to generate revenues is its ability to generate 'Big Data' about user characteristics and behaviours.[189] These data are being analysed extensively to optimise prices, evolve products in ways that respond to consumer demand, and target adverts more effectively, for example, through real-time bidding where every visit to a site generates an auction between advertisers competing to serve an advert to a visitor, depending on their attributes. Although this helps address some of the challenges already highlighted for online advertising, it also of course raises significant concerns – and increasingly, heated protests – about the boundaries of user privacy.

7. Future prospects

The momentum of the technological trajectories that are shaping the convoluted – even chaotic – landscape we have described in this chapter is unlikely to abate in the years ahead. If anything, it is likely to accelerate.[190]

In a situation of uncertainty and market disruption, not even the position of today's corporate giants is assured. Developments in Internet (and stock) markets over 2012, such as the collapse in the share price of Facebook and Zynga soon after their Initial Public Offerings have been linked to these organisations' difficulties in migrating to the mobile Internet (what some investors refer to as 'Web 3.0').[191] Apple stumbled with the release of its new operating system for its iDevices in 2012. Improvements in the HTML5 standard for accessing rich media content in the browser (instead of Apps), and even the appearance of affordable (and crowdfunded) microconsoles may yet overturn the ascendance of 'walled garden' environments over the open Internet as a source of content.[192] And consumer backlash against perceived privacy breaches in social media networks may conceivably increase the appeal of business models that are less reliant on hyper–targeted advertising and Big Data.

Mike Lynch, former CEO of Autonomy, has remarked that only now are we finishing the first phase of the digital revolution. According to him, it will be in the second phase – where computers become better at extracting meaning from data – when 'everything will change.'[193] Other entrepreneurs and commentators have their own favourite 'next big thing', including Wearable Computing, The Internet of Things, Big Data, Assisted Creativity and the Maker Movement. Opinions about what it will be may diverge, but there is general agreement that there will be one.

This is also consistent with the view of scholars of wider general purpose technologies, such as information and communications technologies and electricity.[194] The economic transformations that such technologies bring about are much more than the technical: they require the *"wholesale remaking of infrastructure environments, of business models, and of cultural norms"*,[195] all of which take many, many years to become fully embedded.

The picture we have painted leads to one plausible hypothesis, namely that the race for future leadership positions in the global Internet economy is still on. The question is how the UK's creative economy, which historically has been so strong, can be best positioned to compete in it. The rest of our manifesto looks at what policymakers can do to help.

5 A POLICY AGENDA FOR THE CREATIVE ECONOMY

Having provided the context for our manifesto – one of economic opportunity and technological disruption – in this chapter we look at the competitiveness of the UK's creative economy: how ready is it to harness the growth potential of digital markets? We then propose a framework – we call it the 'creative innovation system' – that identifies the resources that feed innovation in the creative economy, as well as its infrastructure and how it is regulated. In the remainder of the report (Chapters Six to Eleven), we examine the state of policy in each of these important areas, and recommend changes which, if enacted, will support innovation and growth in the UK's creative economy.

1. The competitive position of the UK's creative economy

In cross-country assessments of digital 'readiness', the UK appears in the leading pack in many areas but in others is (in some cases, badly) lagging.[196]

What everyone agrees on is the high level of digital sophistication of UK consumers, who are leading the world in their adoption of the Internet for e-commerce and for accessing creative media. They spend more, for example, on Internet shopping than any other major country: in 2011, the average spending per head on e-commerce was £1,083 in the UK, up 14 per cent from 2010, and ahead of Australia and Sweden.[197] In 2011, UK consumers also became the biggest users of mobile data in the world – pushing Japan into second place – and the same is true for consumption of on-demand television content. Smart phones are already mainstream (as many as 58 per cent of the population have one, behind Spain but ahead of the US, France and Germany), and tablet ownership is rising rapidly too. Meanwhile, UK participation in social media networks has grown rapidly, with 10 million active users on Twitter, and over 30 million active users on Facebook.[198]

More generally, the UK is one of the largest markets in the world for creative content, goods and services – third in filmed entertainment[199] and video games[200] (after the USA and Japan), fourth in TV content[201] (after USA, Japan and Germany),[202] and fifth in Advertising (after the USA, China, Japan and Germany)[203] to name but a few. A large domestic market benefits UK creative businesses because of the well-known 'home bias' in the consumption of creative and cultural content.[204]

On the supply side, we also see obvious areas of strength. This is the case for creative content as well as services, where the UK boasts established players with a growing digital presence alongside born digital start-ups who are experimenting with new business models.

In broadcasting, the BBC is one of the most internationally distinctive (and respected) features of the UK's creative landscape. Its BBC iPlayer is a digital milestone of recent times, and BBC Worldwide already generates 12 per cent of its revenues digitally.[205] Channel 4 and BSkyB are also known for their innovativeness in the commissioning and distribution of TV (including interactive) content; Sky's television sports services have played an important part in making English Premier League football a world leader.

Channel 4's Future Media division generated 5.6 per cent of the broadcaster's revenues in 2010, and 8.4 per cent of its operating profits.[206] Then there is the vibrant independent TV production sector, and young start-ups like ChannelFlip Media, which are exploiting substantial opportunities in online video platforms like YouTube (where it now boasts around 11.5 million subscribers).[207]

There are large global players alongside smaller entrepreneurial companies in other creative sectors too: in advertising there is WPP, but also Albion London, part of the thriving East London cluster of digital creative agencies at the interface between software, advertising, branding, and design.[208] In publishing, we have Pearson (which also owns Penguin[209]), but also Mendeley, a London-based social network and data storage service for researchers (and acquired by Reed Elsevier for £45 million at the time this manifesto was going to print). The Daily Mail, BBC News and The Guardian attract millions of users to their websites each day (MailOnline has more unique visitors than even The New York Times and has reported excellent progress in building online advertising revenues in 2012[210]), while Kickstarter-backed start-up Matter funds its investigative science and technology journalism by selling individual stories that can be accessed on any device.

Fashion has Burberry, Topman and ASOS.com (the latter with 7 million members), as well as cutting-edge designers of wearable technology like Studio XO, and Cassette Playa's augmented reality streetwear. We have already noted the wide range of options on offer for purchasing digital music in the UK, and the recent successes of many independent record labels. In games, while there has been great upheaval for console developers with the closure of studios like Sony Liverpool Studio in 2012 and of Bizarre Creations the year before, social online games studios Jagex and Mind Candy have gone from strength to strength. A recent survey of UK games businesses carried out by TIGA (The Independent Games Association) shows that more than a third of UK games companies are primarily focused on mobile.[211] Oxford-based games publishing and technology company Natural Motion has experienced great success in mobile platforms with its racing game CSR Racing, which it is selling 120 million virtual cars each year. CSR Racing was itself developed by Boss Alien, a spin out from Brighton console studio Black Rock after it was closed by its owner, Disney; this illustrates how the disruption experienced by UK creative sectors can serve to renew their enterpreneurialism.[212]

The UK boasts some of the best-known and most respected arts and cultural institutions in the world, like the Tate, V&A, British Museum, Royal Opera House, British Library and the National Theatre, but also experimental collectives like Punchdrunk, No Fit State Circus and Blast Theory. The claim to having launched the world's first international award in digital art, the Lumen Prize, is made by an organisation based in Cardiff. The award-winning website for New York's Museum of Modern Art (MOMA) was in fact designed by Cogapp, a Brighton-based user experience and web design agency.

The UK also hosts significant operations from some of the world's most successful creative corporations, including Google, Microsoft, Facebook, Sony, IDEO and Nike. YouTube set up one of its two global 'Creator Spaces' to help users produce professional content for its platform in London, while Microsoft has opened Lift London, a games studio that will develop innovative games for tablets.

What little useful cross-country-consistent trade data there are supports the idea that the UK is a significant global player in the creative industries.[213] As the charts below show, the UK's market share of exports to 17 other countries ranks highly in the two categories of services for which UK data are available – Audiovisual and Related Services (including Artistic-related Services) and Personal, Recreational and Cultural Services (which, it should be noted, includes some non-creative areas like health and universities). In Audiovisual and Related Services, the UK has a market share of exports of just under 9 per cent, third in the world after the US and Canada, and in Personal, Recreational and Cultural Services, it is in second-place after the US.

Figure 5.1 Market share and its evolution for Audiovisual and Related Services, 2002-2010

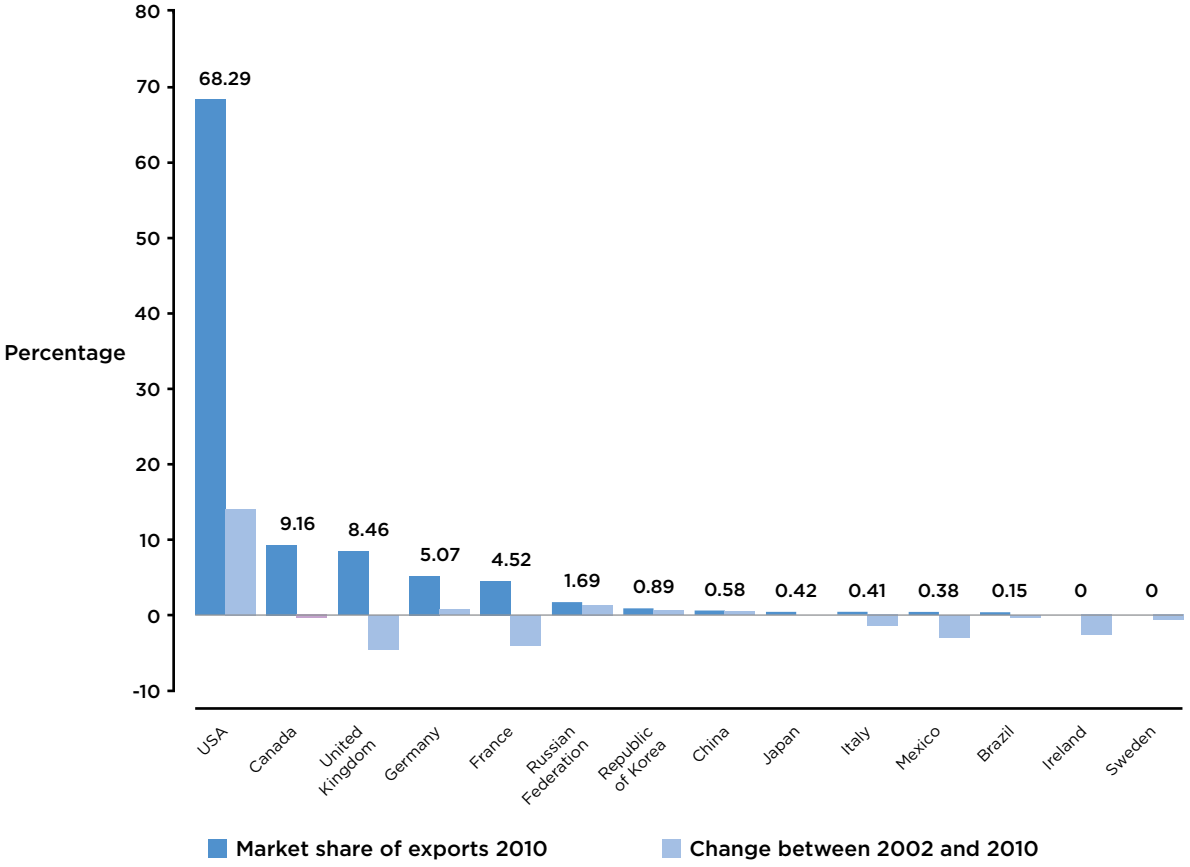
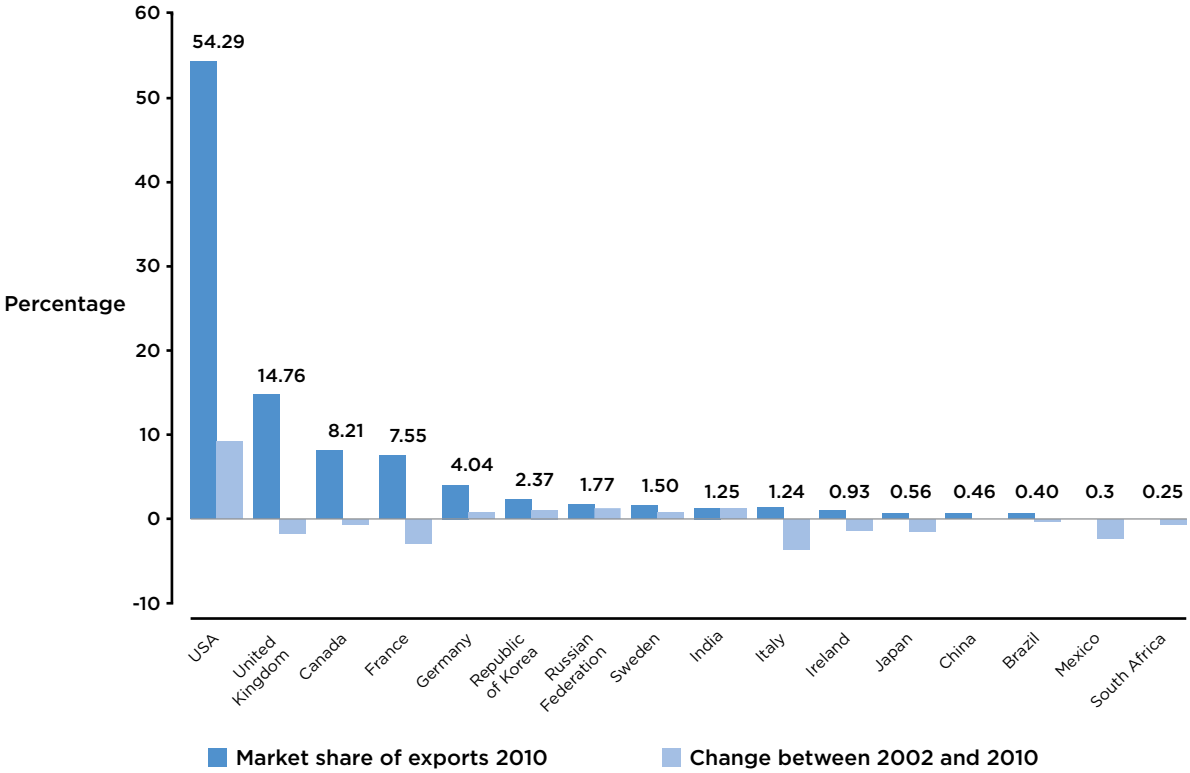


Figure 5.2 Market share and its evolution for Personal, Recreational and Cultural Services, 2002-2010



Source: UNCTAD.

The strengths of the UK's creative economy can be further seen in industry measures of global market share and exports trends. For example, between 2002 and 2011, the UK market share for film almost doubled, from 9.1 per cent to 17.2 per cent.[214] Over that same period, the UK film industry received a sixth of all awards from major academies and film festivals. In the TV industry, the UK is the world's leading net exporter of formats, and in music, the second source of musical repertoire after the US.[215] Meanwhile, in advertising, the UK's creative agencies are consistently ranked second in the world, behind the US.[216]

2. Where are the innovation gaps?

It would be a mistake, however, to assume that all is well with the UK's creative economy. Even a cursory glance at the exports data we have presented indicates, for example, a decrease in the UK's market share for the two sectors for which we have data (in the case of Audiovisual and Related Services, the UK's market share fell by a third between 2002 and 2010).

The UK's video games industry has slipped from third in international development rankings by retail sales in 2008 to sixth in 2010.[217] Canadian developers have overtaken the UK globally, and also in the UK market.[218] This is even before considering online and mobile platforms where the UK faces stiff competition from other countries like South Korea, Sweden, Finland and Germany.

More generally, if we look at the current landscape, it appears that the UK's strengths are mostly around the creation and supply of goods, content and services, rather than in their distribution, or the development of platforms and devices such as those that have come to dominate creative industry value chains. Neither do we see UK companies producing the digital tools that are making the creative process more efficient for professionals and users. For example, although the UK is the undisputed European leader in music production, German companies such as Native Instruments and Ableton control the market for digital music–making instruments and have a strong presence in digital music distribution through SoundCloud.

Yet, arguably, it is the developers of these tools and platforms that stand to gain most from the commercial opportunities presented by the Internet, as that is where the economies of scale are greatest, not least because of the strong network effects we discussed in Chapter Four. As venture capitalist Tim Chang noted apropos the App economy: *"it's too difficult to predict which developers will make money, so we're backing the pickaxe suppliers. The guys who made it really rich in the goldrush were Levi Strauss selling jeans etc. – the enablers and suppliers."*[219]

There is, then, the risk of repeating past mistakes where UK creative businesses generate great ideas – intellectual properties, genre–defining franchises and bold new concepts – that are then fully exploited by others, only this time on the Internet, with digital platforms replacing analogue publishers as the gatekeepers controlling global markets. Even in the absence of potential abuses of dominant position by Internet platforms such as those that we discuss in Chapter Nine, the UK's creative companies may find themselves sliding past the 'sagging middle' and into a long tail which, the empirical evidence presented in the previous chapter suggests, turns out not to be such a good place to be in terms of commercial advantage.

Fragmentation and lack of scale is another worrying – and persistent – feature of the UK's creative economy. As *A Future for British Film*, Chris Smith's recent review of British film policy noted when discussing the progress of the UK film industry since the previous review in 1998: *"Despite the successes of individual films, the strategic goal of more sustained growth across the sector has not yet been achieved."*[220] Business registry data

(available at http://www.ons.gov.uk/ons/rel/bus-register/uk-business/2010/index.html) suggests that in sectors like audio-visual (which comprises 'Motion picture, video and TV production, sound recording and music publishing'), 'Creative, arts and entertainment' (which includes live performance and visual arts) and 'Computer programming and consultancy', around 90 per cent of companies have fewer than four employees, compared with three-quarters in the economy as a whole.

What's more, these data understate the importance of small firms in the creative industries, because the business registry and the official surveys based on it do not cover firms that are neither registered for Value Added Tax (VAT) purposes nor run a PAYE scheme for employee income tax and national insurance contributions.[221] Hard data on how many creative businesses this affects are not available but we know from the ONS's Labour Force Survey that over a quarter of creative practitioners are self-employed, double the proportion for all occupations.

UK creative businesses, mostly small-scale, face the twin dangers of aggregation and fragmentation, with the commercial odds stacked against them on the digital shelves of tightly-controlled walled gardens, or in the wild waters of the open Internet. The best way to confront these risks is through more innovation: in new creative products and services, where the UK traditionally excels; in online business models, so that more of the value added can be captured by UK creative businesses; and in Internet platforms.

The fact that the UK is some way behind its peers in terms of digital infrastructure is a cause for concern in this context. Booz & Company recently put the UK in 12 place in its Digitisation Index, based on the speed, reliability, and ubiquity of the infrastructure, as well as the affordability of access, usability of services, and skills of the population. The UK's average connection speed, at 5.7 Mbps in the middle of 2012, puts it at 18th place in the world, and – despite the government's target of access to 24 Mbps for more than 90 percent of the country by 2015 – the UK is lagging behind several of its peers in the overall rollout of superfast broadband.[222]

If infrastructure were the only digital challenge facing the UK creative economy, tackling it might be straightforward, but our analysis suggests that the UK faces significant challenges on a number of fronts: arts policy; research and development; access to finance; arts policy; competition and regulation (including intellectual property); and education and skills. These are the issues that a policy agenda for the creative economy needs to address. Such an agenda must be informed by a 'system' view of innovation that identifies the resources, policies and frameworks that need to be in place to support innovation in the UK's creative economy, setting the scene for our more detailed consideration of policy solutions in the chapters that follow.

3. A creative innovation system

Academic research over the decades has shown that innovation happens within a system that includes the talent that generates, recombines, and experiments with new ideas, the lenders and investors that support these ideas, and the markets where these ideas are tested.[223]

Contrary to laissez-faire accounts, we know that the public sector plays an essential part in this system – in fact, its action (or inaction, or mis-action) has been used to explain persistent differences in the competitive advantage of nations.[224] Schools and universities produce the skilled personnel that generate innovation, along with much of the knowledge that is deployed in it. The fiscal regime establishes incentives for investing in research and development, while competition and intellectual property regulations set the rules of the game within which competition plays out and rewards are distributed. Governments invest

directly in public goods like infrastructure, and they procure vast quantities of services, as well as scan the horizon to identify promising technologies and set standards that reduce uncertainties about their performance and future evolution.[225]

Networks are the glue that bind this innovation system together – ensuring that information about new opportunities, available resources and good practice are rapidly disseminated, helping different agents – entrepreneurs, businesses, investors, policymakers, regulators and educators – to coordinate their activities, and giving voice to smaller players and fragmented industries which, by their nature, are further away from the centres of power and decision–making.

This innovation system must be adaptable. Social systems as diverse as those built around the institutions of intellectual property and measurement have a strong tendency towards stability or inertia: once a particular way of doing things is established, it can become deeply entrenched.[226] If, for example, an industry is too reliant on a declining business model, it is unlikely to be motivated towards cannibalising its own visible shorter–term interest. This is the famous 'innovators' dilemma' that has bedevilled the digital transition of creative sectors such as music, film and publishing to online markets.[227] Compounding the problem, those who might lose from innovation can become vested interests and lobby policymakers to block change and stop innovation in its tracks.

The way in which all these components are configured varies across industries. This has led scholars to focus their attention on specific 'sectoral systems of innovation', defined as *"a set of products and the set of agents carrying out market and non–market interactions for the creation, production and sale of those products."*[228]

The main building blocks of a sectoral innovation system are knowledge and technology, actors and networks and institutions.[229] There is a rich body of research that has examined how these different blocks are configured in the sectoral innovation systems of industries like biotechnology, manufacturing and information technology.[230] There are no such studies looking at the creative economy, but if we are going to understand how to support innovation within it, we need to understand where this innovation takes place. This is what we mean by the 'creative innovation system.'[31]

In Chapter Three we discussed the essence of creative goods and services ("novel, or significantly enhanced products whose final form is not fully specified in advance of production"), and in Chapter Four we reviewed the trajectories of creative technologies which are manifest in particular industrial structures (characterised by, for example, industrial fragmentation and the presence of gatekeepers). All of these things form components of the creative innovation system. They are joined by the actors, large and small, on the supply side (incumbents and entrepreneurs) and, on the demand side (business clients and consumers).

Here, we focus on the 'public' part of the creative innovation system – that which is more closely aligned with policy domains where action can improve (or hinder) the innovative performance of the creative economy, and therefore, its prospects for growth.[232]

What are the practical needs of the creative economy from this innovation system perspective? What does a creative innovation system look like?

- It has an **education system**[233] – including schools as well as universities, colleges and training providers – which supplies talent with the right mix of skills. In the case of the creative economy, this includes the technical and artistic skills to do creative work, but also the commercial and management skills needed to realise commercial value from it. The education system must also produce consumers with an appetite for innovative goods and services.

- It incentivises **research and development** in the creative industries, just as it does in other sectors through fiscal incentives and funding programmes. Research on IT and software sectoral systems of innovation highlights the importance of basic research which can lead to insights that can then be applied in the private sector.[234] In the creative economy, where innovation often involves the creative deployment of new technologies (not just their production), research in disciplines such as the arts and humanities and social sciences becomes central.[235] Many studies have also highlighted the spatial dimensions of innovation using concepts like industrial clusters and regional innovation systems.[236] These are equally important in the creative economy, with the added consideration of the linkages between not-for-profit arts and cultural institutions, and commercial creative businesses.[237]

- It is hard to overstate the importance for innovation in the creative economy of **risk finance** and the institutions that supply it. The literature on innovation in digital sectors like software and internet services has for example linked access to venture capital to the success of these industries in the USA and Israel.[238]

- The business and technology dynamics that we described in Chapter Four can generate situations of monopoly, and abuse of dominant position. It is the role of the **competition regime** to keep tabs on the activities of gatekeepers, identify abuses of dominant position where they occur, and act swiftly to remedy them. That requires competition authorities who are well-informed and have the power to act speedily and with the authority when necessary. At the same time, the regulatory system, including competition supervision, should not be so costly that it presents a burden or be so heavy-handed that it penalises business success and stymies innovation.

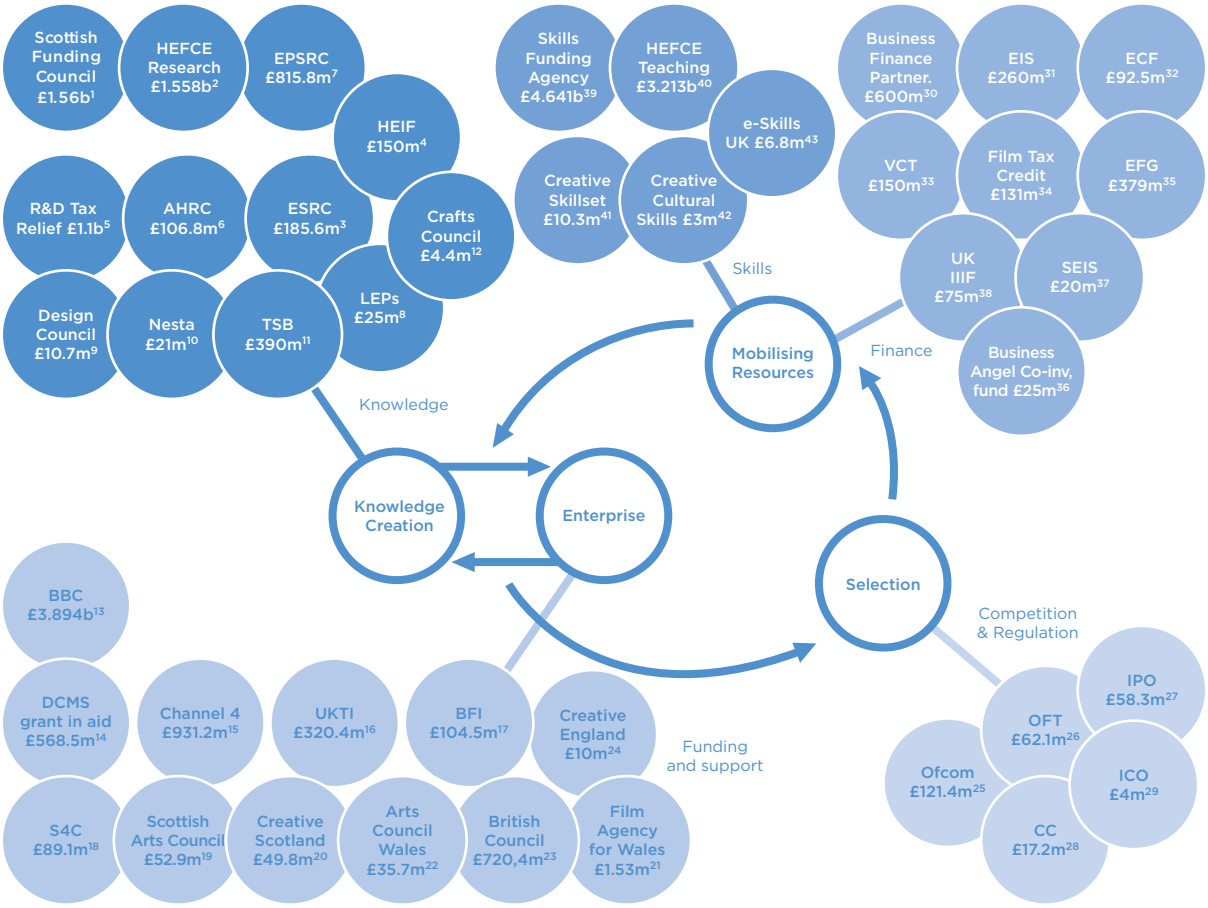
- It has a balanced **copyright** regime which does not pit rights owners against technology companies and users, and which recognises that monetising content on the Internet and allowing access to the public need not be mutually exclusive.

- A unique component of the creative innovation system is the publicly subsidised arts and cultural sector. Public support enables it to take artistic risks that might not be possible in a wholly commercial environment.[239] But partly sheltered as it is from commercial competitive pressures, this sector may need incentives from its funders to undertake **digital innovation** to maximise audience reach and value. It may further need incentives to promote spillovers between the subsidised arts and the commercial creative economy.

- It invests in public **digital infrastructure** where the market might otherwise under-invest, and procures digital services to support innovative delivery of public services and the more effective functioning of government.

Figure 5.3 attempts to bring together all these insights and maps the UK's creative innovation system and the main institutions that comprise it. Budget figures are annual aggregates drawn from public sources unless indicated (no attempt has been made to identify separately spend in the creative economy). In the chapters that follow, we assess how well each component of this system is functioning, and then set out, in practical terms, our policy recommendations in each of the key areas that we have identified.

Figure 5.3 **An institutional map of the UK's creative innovation system**



References:

1. 2011-2012 (includes teaching and research spend); **2.** 2012-2013; **3.** Economic and Social Sciences Research Council, 2011-2012; **4.** Higher Education Innovation Fund, 2013-2014; **5.** 2010-2011; **6.** Arts and Humanities Research Council, 2011-2012; **7.** Engineering and Phsyical Sciences Research Council 2011-2012; **8.** Local Enterprise Partnerships, 2011-2012; **9.** 2010-2011; **10.** 2011-2012; **11.** 2008-2012 (annualised); **12.** 2011-2012; **13.** 2011-2012; **14.** 2010-2011; **15.** 2010-2011; **16.** 2011-2012; **17.** 2011-2012; **18.** 2010-2011 (original commissions); **19.** 2009-2010; **20.** 2011- 2012; **21.** Direct expenses 2011-2012. **22.** 2011 2012; **23.** 2011-2012; **24.** Budget for 2013-2014 **25.** 2012-2013; **26.** Office for Fair Trading, 2011-2012; **27.** Intellectual Property Office, 2011-2012; **28.** Competition Commission, 2011-2012; **29.** Information Commissioner's Office, 2011-2012; **30.** 2012-2014 (annualised); **31.** Enterprise Investment Scheme 2010-2011; **32.** Enterprise Capital Fund, 2011-2013 (annualised) **33.** Venture Capital Trust, 2011-2012; **34.** 2007-2012 (annualised) **35.** Enterprise Finance Guarantee, (overall government commitment); **36.** 2011-2013 (annualised); **37.** Seed Enterprise Investment Scheme, 2013 2014; **38.** UK Innovation Investment Fund, 2009-2011 (annualised). **39.** 2012-2013; **40.** 2012-2013. **41.** 2011-2012; **42.** 2011-2012. **43.** 2011-2012.

PROPOSAL TWO

Policymakers should establish a 'creative innovation system' framework within which strategic priorities can be addressed in a coherent and effective manner.

6 RESEARCH AND DEVELOPMENT

It is widely recognised that innovation – at its simplest, *"new ideas, successfully applied"*[240] – is the driver of long-run economic growth. In the UK, it is estimated that innovation accounted for almost two-thirds of labour productivity growth in the 2000–2008 period, for example.[241]

Similarly, a glance at the creative economy's fastest growing businesses reveals a profusion of innovations. Some of these are technological, like the colossal infrastructure that Facebook uses to manage 500 terabytes of data every day;[242] some are product and service innovations, exemplified by Apple's iDevices; and others are managerial innovations, such as Valve Corporation's famous decision to abolish its hierarchies to increase its employees' productivity.[243] Then there are the 'softer' innovations – new stories, universes and characters – which often build on, but sometimes also inspire, these other innovative activities: Double Negative's ground-breaking visual effects, the interactive iPad app re-curating T. S. Eliot's poem, *The Wasteland*, or accompanying Björk's 2011 *Biophilia* album; or The Guardian Online's intricate data visualisations.[244]

At one level, these innovations are but artefacts and practices – new products, services, ways of working and making money. At a deeper level, they embody knowledge about what is technically feasible and what customers demand: in short, what works and what does not. Microsoft's Kinect shows that it is possible to supply consumer electronics with advanced motion-capture capabilities. Avatar indicates the creative and commercial possibilities of 3D film.

1. A techno-centric view of R&D

Research and development (R&D) is an umbrella term for the investments made to create the new knowledge embodied in innovation – including upstream, riskier basic research as well as less open-ended, more applied activities.[245] This knowledge has some features of what economists call 'public goods', which means that 'first to market' innovators will generally be unable to capture all the returns from their original investments in R&D. Only a fraction of the overall revenues generated by the CGI motion picture market accrued to Pixar,[246] the Californian company that arguably kickstarted this market in its modern guise, for example. The same is true for the Graphical User Interface (GUI) originally developed by Xerox researchers, and subsequently deployed commercially by Apple and Microsoft. Conversely, late-comers can learn from their predecessors' failures and avoid repeating the same mistakes. Electronic Arts' decision in 2012 to change the business model in its much heralded *Star Wars: The Old Republic* Massive Online Game serves as a costless lesson for other companies thinking about targeting that particular market.

These knowledge spillovers – uncounted and unrealised by the innovator – mean that overall levels of investment in R&D will tend to be below what would be socially desirable, providing a rationale for government support. Yet in practice such support is dominated by a 'science and technology-centric' (STEM) view of R&D, despite decades of criticism against such narrowness of vision.[247] In other words, when talking about R&D, policymakers tend to think of people in white coats in the lab, new machines and drugs, which is

quite different from what R&D usually looks like in the creative economy. There, R&D is more often than not geared towards resolving 'product', 'process' and 'business model' uncertainties involving the novel application of technologies rather than scientific and technological ones per se, even though the application can in some cases lead to further technological innovations.[248] Neither does R&D in the creative economy necessarily entail discrete knowledge breakthroughs that can be captured in patents, or even in academic publications.[249] Add to this the fact that creative R&D activities often happen in an iterative rather than 'linear' way,[250] and that they involve sole traders and micro-businesses that, as we noted in Chapter Five, are invisible to official surveys, it should come as no surprise that they can go 'hidden' and unsupported.[251]

The narrowness of official R&D definitions is not concealed, however; indeed, it is openly declared. It is there in how the Treasury routinely refers to the public research budget as the 'science' budget[252] (despite almost £260 million of the £2.5 billion annual budget for the Research Councils being allocated to the arts and humanities and social sciences).[253] And it is apparent in the OECD's Frascati Manual, which provides international guidelines for R&D definitions and metrics, and describes it as including *"creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications…"* HM Revenue & Customs' (HMRC) notes for prospective claimants for UK R&D tax relief state that all *"works in the arts, humanities and social sciences"* are excluded from the definition.

An important implication of all this is that the vast majority of innovation policies in the UK have been designed and implemented with sectors such as manufacturing and pharmaceuticals in mind, which rely on scientific R&D processes, making it harder if not impossible for businesses undertaking creative R&D to benefit from them.

We need to refresh our definitions and step up our efforts to measure R&D in all its forms.[254] We also need to make sure that the innovation policies currently in place in the UK – including R&D tax credits, Technology Strategy Board R&D programmes, demand-led innovation policies (including public procurement), university knowledge exchange programmes and local strategies to develop innovative clusters – are all fit for purpose for the creative economy.[255] We look at each of these in turn.

2. R&D tax relief

R&D tax relief is the main mechanism through which the UK government supports R&D in the private sector (currently to the tune of over £1 billion a year).[256] As typically configured, tax relief addresses an important dilemma in innovation policy: how can the state encourage private investment in innovation while avoiding the seemingly impossible task of selecting in advance which innovation projects will be successful and which will fail? It does so by providing tax relief on R&D spending regardless of project outcomes, on the grounds that this spending generates positive knowledge spillovers whether or not a project succeeds. The empirical evidence suggests that R&D tax relief has a stronger effect on R&D spending in some countries (France, Netherlands) than in others (Spain).[257]

The fact that all businesses in the UK can apply for R&D tax relief means that, in principle, there should be little risk that the public sector distorts investment by favouring some sectors over others.[258] In practice, however, the implementation of the scheme, and the way in which 'eligible' expenditures that qualify for R&D tax relief are defined, raises barriers for innovators in areas like the creative economy.[259] Put simply, the scheme is less supportive of R&D by creative businesses because it was not designed with their R&D processes and outputs in mind.

The UK video games industry – with its technologically able workforce[260] and high levels of innovative activity[261] – is a striking case in point. Given the high potential for application of games technologies in many sectors, we would also expect R&D by games businesses to generate significant spillovers into other sectors. Consistent with this, games engines are used for visualisation and training in other industries, and in the 'gamification' movement, which deploys games–like mechanisms to encourage desired behaviours in users, such as those that promote health, or improve learning outcomes.[262]

However, the video games sector and its R&D activities have distinctive features which, in some cases, prevent it from benefiting from R&D tax relief in the UK. In the first place, innovation in games companies – as in many other creative businesses – is typically organised around collaborative projects which cut across teams rather than in a specialised department in a single corporation. This makes R&D and production entangled rather than sequential, and makes it difficult for developers to account for staff times to prepare R&D tax relief claims in the way that a pharmaceuticals company, say, can account for the time of its research scientists. Furthermore, the success of innovative games technologies, software and designs is determined through testing it with users, however testing activities do not qualify as eligible expenditures for the purposes of the tax relief.[263] Also excluded are the investments in data analytics that help online games companies adapt their products to the needs of users – an increasing problem for intensive users of analytics in other creative sectors like software, advertising and music too.[264]

All of these problems are of course exacerbated in the case of the creative industries which are disproportionately made up of small businesses, as discussed in Chapter Five. Smaller firms naturally find it more difficult to engage with the process of applying and securing R&D tax relief. In its 2011 *Plan for Growth*, the Government announced welcome changes in the R&D tax relief scheme to make it more attractive to SMEs, including an increase in the rate of tax relief for companies with less than 500 employees.[265] HMRC, however, also decided that it did not want to complicate the scheme by adding new qualifying expenditures – which means that the in–built biases against R&D in the creative economy that we have described are still very much a feature of the scheme.[266]

3. The Technology Strategy Board

The UK government also funds R&D directly through the Technology Strategy Board (TSB), its *"prime channel for supporting business–led technology innovation."*[267] The TSB spends roughly £300 million each year on science and technology–focused R&D programmes. In contrast to the (at least in theory) industry–agnostic R&D tax relief, the TSB primarily disburses its funds through targeted R&D grants, challenges and networks which seek to 'connect and catalyse' different parts of the UK's innovation system. As an arm's length body, the TSB can recruit people with the mix of skills it judges necessary to fulfil its remit.

In recent years, the TSB has targeted the creative economy with several initiatives – including a dedicated creative industries knowledge transfer network,[268] challenge prizes through its ICTomorrow programme,[269] various collaborative R&D programmes, and, its newest venture, the 'Connected Digital Economy Catapult' (CDEC).[270] In its 2013 Budget, the government committed £15 million to a new TSB–run competition to support digital content production by consortia involving creative businesses, educational research facilities and training providers.[271] Although these investments are far from negligible in size (amounting to more than 200 projects in total, worth £33 million, in the last five years excluding CDEC and the new competition announced in the 2013 Budget),[272] they have lacked visibility and transparency. As a consequence, it is difficult to judge whether they have been effectively targeted, or have achieved their desired impacts.

In addition to this, the TSB has sometimes faced criticism that its predominant focus on technology-centric R&D (as the organisation's name clearly indicates) prevents it from truly supporting innovation in the creative economy, which it often appears to treat as a subsidiary of digital, rather than a significant growth sector in its own right.

4. Demand-side policies and public procurement for innovation

As by some margin the single largest purchaser of goods and services in the UK,[273] the public sector can in principle engineer a step change in its innovation and growth by using its procurement budget to influence the development of innovative products and services. Yet, despite well-intentioned initiatives such as the Technology Strategy Board's Small Business Research Initiative[274] and a series of design-led challenges run by the Design Council,[275] it is fair to say that the systematic use of public procurement to drive innovation in the UK remains an unfulfilled dream.

Successive reviews have concluded that deep-rooted cultural barriers in government departments lie at the heart of the problem.[276] The current fiscal climate, which leads government departments to prioritise near-term, more certain cost savings over longer term, uncertain service outcomes, reinforces the problem. This manifesto is not the place to revisit these complex issues in any detail, but it is important to note that should the cultural obstacles be overcome, procurement could potentially be a very important driver for innovation in the UK's creative economy.

This is partly because the UK's public sector spends the equivalent of around 1 per cent of GDP on information technology.[277] Within this, government departments have traditionally relied on a small number of large systems integrators to provide their digital services. Such contracts have been lucrative for the winning bidders, but out of reach for many SMEs supplying innovative digital services who find procurement procedures excessively bureaucratic. Partly in recognition of this, the Government is introducing a new Digital Procurement Framework, led by the Government Digital Service (GDS), to streamline procedures so that agile SMEs can more easily compete for government contracts.[278] The push across government to open its data is also partly motivated to stimulate the market for innovative digital services by SMEs.[279] While the steps the GDS is taking to reform departmental tendering processes are very welcome, there is a risk that they may not go far enough to make a dent on digital service markets, nor are they sufficiently joined up with other parts of the public sector (including the BBC).

EU public procurement regulations have also been criticised for creating barriers for SMEs that want to tender for government contracts. The most recent update of the EU Public Sector Directive (which should be implemented during 2014)[280] aims to increase participation of SMEs (from all sectors) – for example, by making it harder for EU governments to set disproportionate financial thresholds for tendering that are harder for SMEs to satisfy and also by permitting the establishment of official lists and certification for pre-qualification purposes which reduces the administration burden in tendering for bidders. The Directive also introduces a new 'innovation partnership procedure' in line with the EU's Europe 2020 strategy for smart, sustainable and inclusive growth.[281] The procedure will allow a contractor to propose the development of an 'innovative product, service or works' in response to a procurement notice in the Official Journal of the European Union (OJEU) where public tenders are announced.

As part of our recommendation that government should bring the creative economy into the frame of mainstream R&D policies, the UK should consider how can these changes be leveraged to support innovation in the UK's creative economy, and to explore the efficacy of leading a campaign in Europe to improve the recognition of the R&D exemptions from the EU public procurement rules as being applicable to the development of digital services, where such services can be shown to be genuine R&D.

In addition to using its purchasing power to 'pull' innovation from its contractors directly, government can also spur demand for innovation by providing incentives for buyers of innovative goods and services elsewhere in the economy (perhaps the best example of this are the so-called 'innovation vouchers' used to encourage more interaction between SMEs and universities). Nesta's previous work has shown how vouchers distributed to SMEs which can be used to buy in the services of innovative creative businesses can also boost innovation in SMEs, at least in the short term.[282] The 2005 Cox Review, which looked at the role of design as a driver of productivity and innovation, made specific recommendations about how this could be done for design, including measures to raise design's profile with managers by scaling up the Design Council's Designing Demand programme, and setting up a national network of creativity and innovation centres.[283] Despite the growing body of evidence in the UK and beyond[284] of the important contribution of design as an intangible investment driving economic growth, this agenda has unfortunately languished in the UK in recent years.

5. The public research base and knowledge exchange

The public funding of upstream, basic research in universities is another route, adopted by governments of all persuasions, to address the market failure which results from knowledge spillovers from R&D. The creative economy is no different in this regard. Funding for computer graphics research by the US ARPA (Advanced Research Projects Agency, later renamed DARPA) at the University of Utah famously resulted in the breakthroughs that gave rise to the modern CGI animation and visual effects industries; it also provided the training ground for creative entrepreneurs that would go on to create Pixar, LucasFilm, Silicon Graphics and Adobe.[285] The 'audioscrobbler' music recommendation algorithm underpinning online radio Last.FM was developed at the University of Southampton.[286] Basic research in the arts and humanities can also open up new creative and commercial opportunities. It develops the store of cultural heritage, traditions and practices that creative content draws on; it contributes to the public's engagement with culture and provides professional reflection on it.[287] Thechineseroom, the games studio behind 2012's indie breakthrough game 'Dear Esther' (which sold a quarter of a million copies within half a year of release), originated from a research project on digital storytelling funded by the Arts and Humanities Research Council.[288]

In recent years, governments have also introduced funding programmes such as the Higher Education Innovation Fund (HEIF) in England, to incentivise universities to apply their research findings for use in the economy. The research impact goals of today's funding regime reflects this aim, the latest of many efforts to avoid universities decoupling research from the needs of the private sector and wider society. As part of this 'impact agenda', universities in the past decade have been strongly encouraged to package their research outputs as intellectual property (typically, patents) which are then available for commercial licensing. The funding that universities in England receive according to the 'Sainsbury formula' measures the success of their external collaborations precisely in these terms.[289]

Here we again see the misalignment between a 'linear model' of R&D, linked to (somewhat outdated) views of the way innovation happens even in science and technology, and the innovation activities (and knowledge needs) of the creative economy, where patent-based licensing packages are rarely of central importance.

Geoffrey Crossick, previously Vice-Chancellor of the University of London and Warden of Goldsmiths', has warned of the dangers of assuming that the types of knowledge that are relevant for the creative economy can be readily codified and transmitted in the form of patents.[290] Instead, he characterises the creative economy as one involving 'knowledge transfer without widgets' which includes diverse knowledge modes sitting anywhere along a spectrum with more or less 'scientific' (that is, knowledge which is predictive and general) and 'humanistic' (knowledge which is interpretive, and intuitive) characteristics.[291]

In many parts of the creative economy, commercial and creative success is linked to the seamless integration of these varied types of knowledge (a theme we revisit in Chapter Eleven in our discussion of education and skills); as the late Steve Jobs said, *"it's in Apple's DNA that technology alone is not enough — it's technology married with liberal arts, married with the humanities, that yields us the result that makes our heart sing."*

The dominant organisational model for universities, where research and teaching are conducted within 'disciplinary silos,' may hinder this 'fusion' of knowledge which is so important for the creative economy. Currently, a number of initiatives are in place to promote cross-disciplinary working, including research programmes that reach across the research funding councils, such as the Global Uncertainties programme,[292] involving all seven UK research funding councils, and the Connected Communities programme, which is led by the AHRC, but supported by the Economic and Social Research Council (ESRC) and the Engineering and Physical Sciences Research Council (EPSRC). The AHRC's funding of four major knowledge exchange hubs focused upon the creative economy represents another initiative to encourage collaboration between academic disciplines and in their interface with business and other players in the creative economy.[293] There is also a growing focus on multi-disciplinary teaching at postgraduate level in areas that relate to the creative economy.[294] These are welcome moves, but both institutional and funding barriers continue to constrain them, leaving them at the margins compared with more traditional 'scientific' inquiry.[295]

Crossick's thesis challenges conventional thinking about how the research base impacts the economy. It also raises difficult questions about the basis for public funding of research in the creative area. If public funding is conventionally justified through the existence of knowledge spillovers, what happens when the knowledge cannot be codified? In what sense is it able to 'spill over'? Perhaps a more convincing economic argument for public funding of research in these cases would be to incentivise researchers to deploy the skills and competences they have developed through their research experience in other socially valuable contexts – including the private, public and third sectors.

In any case, there is some evidence that many arts and humanities researchers are heavily engaged with the creative economy, but often 'below the radar' and in ways which are not well captured by conventional metrics of knowledge exchange. For example, while they are less likely to have taken out a patent, licensed research outputs, formed a business or a spin-out or consultancy than academics in other disciplines, a greater proportion of those working in creative arts and media have had their research applied in a commercial context (25 per cent compared with 20 per cent in non-arts and humanities disciplines). Some 61 per cent of arts and humanities academics interact with other organisations through membership of networks, 55 per cent provide informal advice, and 37 per cent provide consultancy services.[296] This is in line with the interactive view of knowledge transfer in the creative economy advocated by Geoffrey Crossick, where knowledge is *"constituted as a social phenomenon... It is given form in social interactions within the value chains that go outside the academic world".*[297]

Notwithstanding these connections, however, the systems and processes of major research universities are not always well suited to dealing with the SMEs which populate the creative economy. Their time horizons may be very different, and their key personnel may not be familiar with university bureaucracies. Their relationships with university research programmes are bound to be different from the situation in science and engineering, where laboratory- or 'testbed'-based researchers move across the boundaries of business and academia, from lab to lab, with relative ease. The experience gained over the last five years by creative economy 'labs', such as the Bristol Pervasive Media Studio,[298] a partnership between the University of West of England, Bristol University and the Watershed arts centre, is generating useful evidence and experience for addressing this challenge.

From the perspective of universities, a business-focused relationship between academic researchers and digital creative economy companies remains an aspiration rather than a reality. It is still rare (though by no means unknown) to find business school economists and arts and humanities researchers who are comfortable with and knowledgeable about issues of computer science and digital technology. The cross-research council Digital Economy Programme, which since its inception in 2008 has invested £138 million, is an important case in point. Independent evaluation of the programme's work to date suggests that it has generated strong peer-reviewed research outputs, but that its economic impact has so far been limited. Some 72 per cent of the grants awarded have been led by Principal Investigators with an engineering and computing background. The equivalent numbers for arts and humanities and economics are negligible. The evaluation panel concludes that *"Our biggest concern is the need for more economics and business understanding of digital economies to put alongside the technological and user aspects."*[299]

BOX 6.1: Stanford University and the growth of Silicon Valley

Silicon Valley in the San Francisco Bay Area is of course the most well-known example of a successful and sustainable ICT cluster. It has been the subject of many academic studies (e.g. see Saxenian, 1994, Feldman and Braunerjehlm, 2007), yet a number of myths persist. While it is often characterised as a hotbed of entrepreneurial, private sector-led innovation and growth, the very significant role played by the public sector is less often acknowledged. This is the case too with the academic community, in particular Stanford University, which has been a crucible of new technologies and high-tech start-ups, making a considerable contribution to the economic success of the Valley.

Stanford's model since Frederick Terman set up the Stanford Industrial Park in 1951 is the textbook example of a virtuous cycle: attract and retain academic talent that can bring in federal research funding and use those funds to develop industrially-relevant research, which can in turn build capacity for more and better research. Stanford has been an undeniably important part of the Silicon Valley success story. It has been estimated that Stanford technology start-ups accounted for 60 per cent of Silicon Valley revenues in 1988 and 1996 (including Hewlett Packard) (Lenoir, 2004).[300]

The strength of this model stems from the synergies it builds between public funding and industry-relevant research. Collaboration with industry gives Stanford a competitive advantage when bidding for Federal research funding, as well as opportunities to carry out contract research (that said, while Stanford does well in terms of industrially funded R&D activity, this remains a relatively small proportion of its overall research income, particularly when set against the costs of conducting this research).[301]

Stanford's ability to work closely with industry, and to spark new waves of entrepreneurialism in Silicon Valley, is enhanced by its flexible approach to IP, which for example made it possible for Jerry Yang and David Filo, and Larry Page and Sergey Brin, to spin out Yahoo! and Google from Stanford, even though both innovations had been developed while they were studying their PhDs there (in the case of Google, Stanford had even taken a patent on the Search engine, but ultimately determined that Brin and Page were best placed to develop the technology and licensed it to them). These entrepreneurial duos were therefore able to exploit their inventions. In the case of Yahoo!, the university benefitted indirectly through the creation of the Yahoo! Founders Chair in Stanford's School of Engineering.

Stanford also operates a programme called Media X through which it disseminates new research and technology around human computer interaction to a wide network of industry members in the media and entertainment sector. These industry members pay a fee for access to this knowledge and for the ability to shape Stanford's research agenda by participating in the design of research themes for interdisciplinary teams across Stanford's faculty. Again, the application of IP policy by Media X is flexible. In the words of one senior researcher, they *"trust that value will return to them in other ways".*

Sources:

Saxenian, A. (1994) 'Regional Advantage.' Boston, MA: MIT Press; Braunerhjelm, P. and Feldman, M. (Eds.) (2007) 'Cluster Genesis.' Oxford: Oxford University Press.

Lenoir, T. (2004) 'Myths about Stanford's interactions with Industry.' See: http://iis-db.stanford.edu/evnts/4097/TLenoir_Myths_about_Stanford.pdf Ku K. (2002) 'Software Licensing in the University Environment.'; Interview conducted as part of an evaluation of the Edinburgh–Stanford Link Programme for Scottish Enterprise (EKOS, 2004).

6. Creative Clusters

It is well known that innovation has an important geographical dimension; that ideas move more quickly and easily between companies that are located close to one another. This is because it is easier to see (and imitate) what happens 'at your doorstep' than on the other side of the world. Knowledge is often circulated through personal networks, or when individuals move between companies, or start new ones – they tend for various reasons to do this within the same location, as long as there are the opportunities for them to do so.[302] Together with the fact that a critical mass of companies within an industry tends to attract skilled labour, as well as specialist suppliers and investors (what economists call 'agglomeration economies') these innovation spillovers generate 'clusters' – highly productive, innovative, fast–growing and potentially resilient concentrations of companies.[303]

Echoing the importance of innovation in the creative economy, we find that creative businesses have a remarkable propensity to form these clusters. In fact, some of the most renowned clusters in the world – IT, software and Internet companies in Silicon Valley and film in Hollywood – are overwhelmingly 'creative' as we have defined it in Chapter Three (See Box 6.1 for an account of Silicon Valley and the role of Stanford University in its growth).[304] Nesta's mapping of the geography of creativity in Great Britain shows that while London dominates the landscape, there are other important 'creative hotspots' beyond the capital – in cities like Manchester, Brighton, Cambridge, Edinburgh and Cardiff, to name but a few.[305]

There also appear to be important complementarities between the (not–for–profit) arts and cultural infrastructure and the commercial creative economy. These complementarities are at the heart of the influential 'Creative Cities' idea put forward by US economist Richard Florida. According to Florida, a city's arts and cultural scene makes it more competitive and wealthy by providing services and experiences that attract creative and entrepreneurial professionals.[306, 307] Currid (2007) attributes much of New York's outstanding success as a creative hub to the web of informal social networks surrounding its vibrant nightlife.[308] Pratt (2009) documents a similar story in London's Hoxton in the 1990s,[309] and emerging evidence from the AHRC Brighton Fuse project (which looks at digital media companies in Brighton) points in the same direction.[310] Glasgow is yet another example in which culture has played a key role in both regenerating the city and contributing to its creative renaissance.[311] A recent Nesta study looking at the connection between arts and cultural clustering and the salaries of professionals in the 'commercial' creative economy in English towns supports the idea that the urban arts and cultural infrastructure makes a significant contribution to their productivity.[312]

Both clusters and creative cities frameworks have however been heavily criticised by researchers who have questioned the way they are defined, the assumptions that underpin them, how feasible it is to build them, and the benefits that they can actually generate.[313] This has not stopped policymakers (in the UK and elsewhere) from trying to 'catalyse' them where they didn't exist previously, or to scale them up where they did.

So, we have seen strategies aimed at attracting inward investment by 'anchor tenants' (currently in the case of East London's Tech City);[314] and by incentivising creative businesses to integrate into local supply chains (Manchester).[315] Other cities have bet on their cultural sectors (Glasgow, Liverpool), in the hope of building a 'creative brand' that is attractive for the highly educated professionals that Florida includes in his 'creative class'.[316] There have been many place-based interventions aimed at creating entrepreneurial networks where wider informal learning can take place.[317] Universities have also tried to nurture some of these creative clusters, not least by providing incubators and facilities for creative start-ups and spin-outs.[318]

The track record of these initiatives is patchy to say the least. This is partly a consequence of unrealistic expectations among policymakers – experience suggests that successful clusters develop organically and over long periods of time. They are very hard to 'build from scratch', which is what some policymakers have tried to do.[319, 320] In some cases, they have erred by attempting to import lessons and models from other places 'wholesale', without paying sufficient attention to local circumstances and conditions. Silicon Valley and Bilbao have been used as the templates for 'cookie cutter' creative clusters and cities in some parts of the UK, with returns which are, as yet, far from clear.

7. An agenda to support R&D in the creative economy

Many of the defining features of the creative economy and its R&D processes that we have discussed make it a difficult target for innovation policy – the way it integrates diverse knowledge bases, including non-STEM as well as STEM disciplines, the importance of 'non-technological' forms of innovation, the rapid rates of change in the technologies they use and the markets they serve, and last but not least, the micro size of the vast majority of creative businesses. But, as a significant and rapidly growing part of the UK economy, its contributions to R&D and innovation can no longer be ignored.

All of this suggests that policymakers responsible for designing and funding existing approaches to R&D need to take a hard look at the framework and policies currently in place. The aim should be to remove the inbuilt biases which create undue barriers for creative businesses seeking to benefit from existing structures, whilst re-designing initiatives on the basis of evidence from the growing number of creative economy experiments.

In the case of the R&D tax credit, it is time to take seriously the new classes of R&D expenditures in areas such as online usability testing and analytics which UK companies will need to undertake to thrive in online markets.[321] Policymakers should also examine the lessons emerging from overseas experiments, such as Singapore's Productivity and Innovation Tax Credit, with its wider class of eligible R&D expenditures, and their applicability in the UK.[322]

The AHRC's commitment to strong, new channels for knowledge exchange is clearly set out in its latest strategy document.[323] A £16 million investment in four knowledge exchange hubs for the creative economy (2012 to 2016) promotes experimentation in a number of directions: REACT, the Bristol-based hub in which one of the authors of this manifesto is a participant, is focused upon brokering commercially valuable links between arts and humanities academics and small technology firms.[324] Similarly, the Design in Action hub in

Dundee is researching, developing and evaluating new products and processes through the application of design principles across a range of sectors from health to energy. These experiments deserve, and require, rigorous monitoring and mining for lessons of success and failure. They, and other Research Council programmes, should also attach more importance to developing collaborative research strategies with universities in other countries (such as the US and China) where the UK has much to learn. This may require looking at the terms and conditions dictating where research money is spent.

The TSB's recent efforts to engage with creative businesses is most welcome, but at a strategic level it has been hindered by too narrow a focus on technological innovation. With the CDEC, it has the opportunity to pull together its various workstreams with creative and digital businesses into a genuine Creative Economy Programme, covering areas as wide as health and education, where the creative use of digital technologies has great potential. In its pre-launch phase, the Catapult team has worked hard to breach the cultural line which separates small creative and technology companies from the big industrial players who play leading roles in other Catapults.[325] The CDEC should be viewed as another, important experiment, with potentially significant implications for the TSB's innovation agenda in the creative economy. But this also means that it needs to be evaluated rigorously, in order to assess its impact, and learn from it.

Elsewhere in the UK, the challenges of shoehorning creative businesses into mainstream innovation support mechanisms has led to the development of small-scale but more targeted initiatives aimed at encouraging creative innovation. The Northern Ireland Executive's Creative Industries Innovation Fund is one such example, in which creative businesses can apply for funding support to undertake collaborative R&D projects that cross sub-sector boundaries. In its first round, the Fund distributed £4 million to creative businesses, and preliminary data from its evaluation suggest that it has been successful in promoting innovation activities, with almost three-quarters of recipients claiming to have developed new products and services.[326] The Fund has re-launched with an additional £4 million of funding over the next three years. Welcome though these initiatives are, they are fragmented and do not solve the fundamental mismatch between the needs of the creative economy and the approach of mainstream innovation support.

In the area of clusters, in Box 6.2 we set out some lessons from past experiences in cluster development that will be relevant for regional and local bodies trying to spur innovation and growth in their creative economies. In particular, policymakers must resist the temptation to build greenfield creative clusters, and instead take a hard – and realistic – look at existing industrial strengths. They should follow a more 'data-driven approach', mining data to establish where there are 'latent' agglomerations in their regions which, with the right support, could develop the dense web of networks that are conducive to clusters, innovation and growth.[327]

In this respect, initiatives like the Tech City Map,[328] the Cambridge Cluster Map[329] and the AHRC's Brighton Fuse[330] are attempts to adopt a more pragmatic, consultative and evidence-based approach to cluster development that should be encouraged and rolled out more widely[331] (and in the case of the Brighton Fuse at least, one that also acknowledges the complex connections between the not-for-profit arts and cultural infrastructure and the commercial creative and digital industries). Related initiatives in Scotland (such as Creative Clyde),[332] Wales (the proposed Cardiff Bay Creative Industries Hub) and Northern Ireland (Creative Industries Innovation Fund, see above) reflect the growing salience of devolved political structures in the design of industrial policy and, in principle, add diversity to the UK creative economy's R&D base. Without the capacity to rigorously evaluate evidence and absorb lessons, however, much of the energy involved in these numerous initiatives is likely to be wasted.

BOX 6.2: Seven rules for creative clusters

1. **Be pragmatic:** Policymakers would be well advised to avoid wishful attempts to build clusters from scratch – successful examples are few and far between, not least because new clusters in an industry need to overcome the critical mass and reputational advantages enjoyed by established ones. A more productive approach is to build on areas or niches of existing strength. Seeking to take a budding or 'latent' creative cluster to its next level is a better idea than trying to spawn one from scratch.

2. **Be data-driven:** Policymakers should use data to identify where are the areas of existing local strength. This includes measuring the number, size and trajectory of local firms in different creative sectors, and the types of graduates and research being produced by local universities. It is straightforward to benchmark against other places using labour market data from websites like the ONS's Nomis (http://www.nomisweb.co.uk/). Policymakers should however bear in mind the limitations of official data sources where micro-businesses and freelancers are often unrepresented, or which may fail to capture the activities of emerging sectors, and explore other potential sources of data like social networking sites or company websites. An example is the use of Spotify registration data in BPI's 2013 Digital Music Report (https://www.bpi.co.uk/assets/files/BPI_Digital_Music_Nation_2013.PDF)

3. **Think systemically...:** Creative clusters are in several ways 'miniature' versions of the creative innovation system portrayed in Chapter Five – incorporating a local labour market (skills) and research base, finance, competition, collaboration and (physical, digital and cultural) infrastructure (although the IP and competition regimes are designed and implemented at the national level). This means that discrete interventions will rarely be enough to support sustainable growth in a cluster – it is important to pay attention to the whole system.

4. **...and listen:** Policymakers should adopt a similarly data-driven approach to identifying barriers to cluster development and the potential remedies. Learning from experiences outside is important, but this requires rigorous evaluations of cluster policy and detailed consultation with local businesses (http://www.nesta.org.uk/publications/working_papers/assets/features/the_effects_of_cluster_policy_on_innovation). When doing this, it is important to minimise the risk of capture by local vested interests by listening to all the voices in the cluster. Policymakers should recognise that innovative creative businesses with the greatest growth potential will often be those with the least time to meet them.

5. **Raise visibility and strengthen networks:** An unconnected, 'un-self-aware' mass of creative businesses will not benefit from knowledge spillovers or from lower transaction costs. Policymakers can help remedy this situation by supporting local business networks, and bridging the gap between communities and groups with complementary resources and capabilities (for example, content and digital media businesses, or artists and technologists). This 'profile-raising' can also help highlight local job opportunities to creative graduates.

6. **Invest in people as well as buildings:** Policymakers have often conceived of interventions to support clusters in terms of new buildings – such as incubators, cultural quarters and iconic arts centres – rather than investments in creative and entrepreneurial skills. Yet, it is creative talent which, ultimately, drives innovation and growth in the creative economy. Policymakers should always

weigh the opportunity costs of investments in 'bricks and mortar' against the benefits of other interventions (for example, training sessions or work placements and internships for creative graduates) which may have less visible outputs, but be more beneficial in the long run.

7. **Leverage anchor institutions:** Universities have a central role to play in creative cluster development strategy. When doing this, they need to think holistically about how their different functions (suppliers of talent, research, networks, support services, entrepreneurialism and facilities) can support local creative clusters. This may require them to bridge disciplinary and departmental silos (http://www.brightonfuse.com/wp-content/uploads/2012/02/Brighton-fuse-universities-and-cdit-clusters.pdf). A live example of where this is being done is the International VFX Hub at the National Centre for Computer Animation at the University of Bournemouth, which combines working with local schools, knowledge transfer through PhDs in industry, support for graduate entrepreneurship and access to facilities in an effort to boost post-production, animation and CGI in Bournemouth.

PROPOSAL THREE

The Government should make R&D tax relief more accessible to creative businesses. Technology Strategy Board programmes should be further broadened to address the needs of the creative economy. Public procurement rules should be changed to open up opportunities for smaller digital firms. Cross-disciplinary Research Council knowledge exchange initiatives should be rigorously evaluated and the lessons applied in a further round of investment. More international collaborations with leading research centres should be encouraged.

PROPOSAL FOUR

Local policymakers should observe our seven-point guide for developing creative clusters.

7 ACCESS TO FINANCE

1. Barriers to finance in the creative economy

The defining feature of creative work – its focus on generating differences whose final form cannot be fully specified in advance – echoes a striking feature of most creative product markets, namely that it is extremely difficult to predict demand for a product before it is launched in the market.

There are, of course, differences across creative service and content sectors – the 'form' of an advertising campaign commissioned by a client, for example, will tend to be more tightly specified than that of a new film or a new video game targeting consumer markets.[333] But even there, the requirements of advertisers can change rapidly (not least because of technology disruptions such as those we described in Chapter Four). In other words, there is a great deal of uncertainty in these creative markets as well. Creative businesses partly deal with this situation by organising production around projects that bring together bespoke teams of creative professionals for limited periods of time.

Although this 'flexible specialisation' makes creative businesses nimbler and more responsive to changes in the market,[334] it also results in the industrial fragmentation that we described in Chapter Five.

Together with the uncertainty that characterises creative markets, this shuts out most creative businesses from loan finance: not only is past track record a less reliable guide to future success, but creative businesses are less likely to have fixed assets they can use as collateral.[335] What assets they do have – copyright in the case of content businesses – are intangible and much more difficult to value and sell in the case of default. The same uncertainties mean that creative businesses face greater barriers to accessing equity finance too, because investors require (prohibitively) high rates of return to compensate them for the risks they are taking.[336, 337]

But without access to loan finance, many creative businesses struggle to manage their cash–flow. And without risk finance, there is little scope for the entrepreneurship and risk–taking that they need to innovate, and therefore grow. There is a perennial concern that these barriers to finance make it hard for UK creative businesses to reach a global scale (which in turn might enable them to diversify project risks),[338] or to hold on to their intellectual property (which they may need to sell off to finance their next project).[339] The prima facie evidence for the existence of such access to finance problems is that many investors appear unwilling even to consider creative industries as an investment asset class.[340]

The micro size of the vast majority of the UK's creative businesses in fact underpins many of the other challenges discussed in this manifesto: smaller companies typically lack the capacity to engage in R&D or the incentives to invest in the human capital of their employees. They lack the firepower to contest incumbents in creative markets. The clusters literature suggests that larger companies in contrast can act as 'anchor tenants' supporting complete value chains in the local economy,[341] and also spawn innovative spin–

offs that keep clusters entrepreneurially-renewed.[342] The sheer extent of the challenges makes starting and growing a creative business daunting for even the most seasoned of entrepreneurs.

And yet, despite the endemic nature of these problems, the UK's creative industries have not traditionally done a good job in articulating them. There is a striking disconnect between the volume of complaints by creative business leaders about the problems in accessing finance[343] and the volume of hard evidence available to back their claims. No doubt this is in good part reflects the fact that many creative industries lack a culture of collecting and producing the data that investors need to assess risks and make informed investment decisions, and that policymakers need to craft interventions. And where there is data it tends not to be publicly available.[344]

But it is also reflective of the wider problem that many creative businesses lack the commercial nous to grow their business. The vast majority of creative businesses frequently fail to produce formal (or even informal) business plans,[345] fuelling the perception that they are not 'investment-ready.'[346] This is especially problematic when it is considered that general investors are likely to be much less familiar with the business models that characterise the creative industries.[347]

What little quantitative evidence there is does however support the view that UK creative businesses face barriers to finance which prevent them from scaling.

An econometric study commissioned by DCMS and BIS from researchers at Warwick Business School in 2011 revealed that early-stage small-and medium-sized enterprises in the software and content industries like Radio & TV, Publishing and Film, faced greater difficulties acquiring finance than companies with similar risk profiles in other sectors, and that this had a material impact on their ability to grow.[348] Content companies, the study concluded, were discouraged from even seeking external finance in the first place.

Anecdotally, it seems that UK creative businesses with the most promising growth potential are acquired by global (often US) multinationals. An example of a likely wider phenomenon – and part of a general debate about the attitudes of British business leaders to exit[349] – this is something that has also been linked to technical issues with the operation of UK capital markets, which make 'selling out' to overseas bidders more attractive than a stockmarket listing.[350] Although of course overseas takeovers need be no bad thing for the UK – that depends on the price at which the companies are acquired – there are high-profile cases where British companies appear to have been 'hollowed out' after takeover, meaning that the UK has lost out on the ancillary benefits from having UK-owned creative businesses.[351] So, for example, games developers Bizarre Creations (taken over by US games giant Electronic Arts) and Black Rock Software (acquired by Disney) were both shut down scarcely five years after being taken over. Web 2.0 darling Dopplr all but disappeared from the map after being bought by Nokia.[352] There is also a related perception that the capital gains tax revenues that are generated for the UK Exchequer from one-off sales of UK creative businesses to foreign acquirers are much smaller than the tax revenues that would have cumulated from corporate profits if the businesses had instead been retained in the UK.[353]

Another variation on the theme that the UK's creative businesses 'sell early' and fail to fully capture the commercial value of their ingenuity and innovation, is in the so-called 'intellectual property poverty trap' where the suggestion is that UK content businesses in sectors like film, publishing and video games have no other option but to sell their IP to powerful (overseas) gatekeepers in order to complete their projects and bring their content to market.[354] In doing so, it is argued, they relinquish the future royalties which they might have otherwise reinvested in growing their business.

This structural feature of the UK's creative creative content markets helps explain why, for example, even though a full third of the 200 highest grossing films at the global box office made between 2001 and 2012 were produced or originated in the UK,[355] the UK film industry still has very few production and distribution companies of global scale. The most well-known British film production company, Working Title, is owned by NBCUniversal. eOne, the most successful UK-based independent film distributor, is Canadian-owned.

Many voices in the UK's creative economy are concerned that this IP poverty trap may, if not addressed, transform the UK into a nation of 'work-for-hire' creative contractors, competing with their overseas counterparts on cost, rather than quality grounds, and not enjoying the upside when their creative projects are a success.[356] Evidence from the AHRC Brighton Fuse research project supports the idea that UK companies fail to hold on to the IP they generate: just 15 per cent of the creative and digital companies producing copyright that were surveyed identified royalties as a significant source of revenues (in contrast, 71 per cent said that business-to-business services were significant).[357] Content companies were also twice as likely as others to report access to finance issues as a significant barrier to growing the business.[358] A sample of 30 leading video games companies surveyed by Games Investor Consulting for Nesta in 2009 claimed that original IP development in the UK was in decline, or had stopped altogether.[359]

But perhaps the starkest indication of access to finance problems in the UK's creative economy in 2013 is in the lack of young, digital native companies with a true global scale. Without exception, the large UK creative businesses mentioned in Chapter Five are all decades old: Pearson was established in 1841, and Burberry in 1856. WPP was founded in 1971, and EMI (now of course owned by Universal Music Group) in 1931. The situation in the US could not be more different, with Amazon having been founded in 1996, Google in 1998, Facebook in 2004 and Zynga in 2007. One could also look at Israel, which has achieved the highest concentration of high-tech start-up companies anywhere outside of the Silicon Valley in less than two decades.[360] High-tech industry now accounts for more than 54 per cent of Israel's industrial exports and over 26 per cent of the country's exports.[361]

The recognition that the UK's creative economy faces access to finance problems, and the belief that policy can do something to help, explains why the UK's creative industries leaders have set up a dedicated Working Group under the Creative Industries Council to look at these issues (on which one of this manifesto's author sits.)[362]

2. The role of policy

Of course, the concerns that innovative businesses in the UK face barriers to accessing finance go well beyond the creative economy. There are longstanding complaints, for example, that British banks are not sensitive to the needs of SMEs.[363] And for years there has been talk of an 'equity gap' preventing UK businesses in innovative and high-tech sectors from realising their growth potential[364] – a situation that has been made even worse by the current credit crunch. The Government has attempted to address these problems through a number of policy interventions.

Some of these are aimed at improving access to bank finance. This includes Funding for Lending,[365] the Enterprise Finance Guarantee,[366] the National Loan Guarantee and the Business Finance Partnership (which seeks to increase the diversity of sources of finance for UK businesses).[367] These programmes variously use public funds to reduce the costs of borrowing for SMEs, either by providing loan finance to banks themselves at below-market interest rates, or using public funds as the guarantee for unsecured bank loans with the intention of increasing bank lending to businesses that lack the assets that could be used as collateral. The Business Bank which will start operating in 2014 also seeks to improve access to loans for SMEs.[368]

The Government has also encouraged private equity investment in UK businesses, in two principal ways.

First, through tax efficient schemes allowing investors to claim income and capital tax relief on their equity investments on qualifying companies. These schemes include the Seed Enterprise Investment Scheme (SEIS) aimed at smaller, entrepreneurial companies (businesses can use it to raise up to £150,000 per annum),[369] the Enterprise Investment Scheme (EIS, with a limit of up to £5 million per annum),[370] and Venture Capital Trusts (VCT, where investors buy shares in a qualifying venture capital fund that subsequently invests it, with a maximum investment of £5 million per company per annum).[371]

Second, through publicly-backed venture capital funds operating under the umbrella of Capital for Enterprise (CfEL), a fund management company owned by BIS.[372] CfEL's portfolio includes 12 Enterprise Capital Funds, the UK Innovation Investment Fund, and the Business Angel Co-Investment Fund (which co-invests with syndicates of 'business angels').

In addition to these specific fiscal interventions, the government and the Bank of England are paying growing attention to the operation of UK capital markets, and how they can be regulated in ways that encourage more 'patient' and 'long-term oriented' lending and investment supporting innovative sectors with high growth potential. The Kay Review of UK Equity Markets published in 2012 concluded that *"short-termism is a problem in UK equity markets."*[373] In 2012, the Government also announced that it was working with the London Stock Exchange to reduce regulation (such as rules on 'free float', eligibility criteria and reporting requirements) so as to make it easier for medium-sized growth firms to list their shares in London instead of seeking capital in the USA.[374] Early in 2013, the London Stock Exchange announced that it would be creating a 'High Growth Segment' for medium-sized companies looking for capital on the way towards listing in the main market.[375]

Going beyond these 'sector-agnostic' schemes and changes in regulation, the UK government pumps significant amounts of finance into the creative economy through public broadcasting,[376] Lottery funds[377] and production tax credits[378] for culturally British films.[379] Although this tax relief is formally justified as a cultural intervention – it funds the production of 'culturally British' films in compliance with EU State Aid rules – in practice it makes the UK a more attractive location for commercial film production. It helps explain why in 2010 the British Film Commissioner could claim that it was 40 per cent cheaper to make a film in the UK than in the USA and 7 per cent cheaper than even in Czechoslovakia, despite lower labour costs there.[380] The present government has also approved production tax credits for animation, 'high end' drama, and video games broadly along the lines of the film tax relief, although with modifications that recognise the technological and business specificities of these other industries. These measures have been introduced in the Spring 2013 budget.

The amounts involved in all of this public activity are very substantial: in 2012, Nesta estimated that publicly-backed finance for early-stage businesses (including Enterprise Capital Funds, Seed Enterprise Investment Scheme, the Enterprise Investment Scheme, Venture Capital Trusts, the Business Angel Co-Investment Fund and Early Growth Fund) during their current funding round was worth £773 million in total.[381] The Enterprise Finance Guarantee represents a commitment of £379 million.

In 2011, the British Film Institute spent £104 million (this includes almost £35 million of Lottery funds spent on film production and distribution),[382] and Arts Council England £604 million (including £450 million in grant-in aid from the Government, and £151 million from the National Lottery).[383] Since 2007, HMRC has paid £789 million on account of film production tax relief.[384] The BBC alone spent £1 billion on UK-produced content in 2010-2011.[385]

What have all of these interventions meant for access to finance in the UK's creative economy?

A major difficulty in answering this question is that little data are publicly available on how many creative businesses have accessed finance through the various schemes, and where they have, what has been the impact? Going beyond wider concerns about the effectiveness of measures like publicly backed venture capital,[386] there have been complaints about how some of these schemes *de facto* exclude creative businesses (echoing the concerns about R&D tax relief that we discussed in Chapter Six). So, for example, the general perception that creative businesses in sectors like music were being denied access to the Enterprise Finance Guarantee by banks because 'music is too risky a sector' led the BIS Select Committee to claim in 2010 that it was *'unacceptable that the creative industries sector — which generates around £4 billion a year in the United Kingdom and is one of the six sectors designated by the Government as growth sectors — [was] effectively being excluded from this avenue of funding.'*[387]

A 2011 Demos report argued that the treatment of royalty payments in the EIS reduced its usefulness for copyright businesses.[388] In a 2010 study of project finance, Nesta identified features of EIS and VCTs that created barriers to their use in the video games sector.[389] And in its submission to the Culture and Media Select Committee's 'Support for the Creative Economy' Inquiry, investment house Ingenious Media claimed that confusion and sluggishness in the management of EIS at HMRC was having adverse effects on investment in creative businesses.[390]

The December 2012 report for the Creative Industries Council from its Access to Finance Working Group echoed these concerns in its call for the Government to undertake a systematic review of existing interventions to ensure they do not discriminate against creative businesses. It also recommended the creation of new schemes such as a dedicated finance guarantee to improve access to bank lending for the creative industries, and a sector bid to the Business Finance Partnership which is setting up funds to act as new sources of lending for UK businesses, going beyond banks.[391] It also proposed a broader host of measures to improve the awareness and take-up of existing initiatives, and industrial policy interventions to raise the investment-readiness of creative businesses, including public initiatives to enhance networking between the creative and investment communities.[392]

Judging the impact of the various subsidies and tax reliefs is actually more difficult than it might seem given the availability of economic impact studies published by subsidised cultural institutions[393] and the now-defunct UK Film Council.[394] This is because the commissioning organisations have had strong interests in presenting support measures in a positive light, and the independence of the results have therefore been questioned. The interventions have never been designed, and the data collected by policymakers, to permit their rigorous evaluation.

That said, it is difficult to question that measures like the film tax relief have had very strong positive impacts through attracting inward direct investment in the UK's film making capacity,[395] and beneficial side effects like supporting the growth of the visual effects cluster in London's Soho (even if it is difficult to estimate what growth in the sectors would have been in the absence of public investment).[396] Likewise, it is self-evident that investment by the UK's public service broadcasters, supported by measures such as the Terms of Trade for independent television producers,[397] and spending by the wider public sector on digital media,[398] has been a significant driver of growth in the UK's media sectors.

3. Our recommendations

A number of clear principles emerge from our analysis which echo the priorities of the Creative Industries Council's Access to Finance Working Group. For policy, foremost is that the Government must pay explicit attention to the needs of creative businesses during the design and management of general programmes to support finance and risk-taking in the UK economy.

But to enable this, and for their part, creative businesses need a step change in their attitudes to financial and economic data. Not only would the production and sharing of more rigorous and timely data inform the design of policy interventions, it would also, crucially, open the doors to new sources of private finance. In the same way that it has led mainstream policymakers to question the susceptibility of the creative industries to strategic interventions, an ambivalent attitude to data has contributed to the perception that creative businesses are not a serious proposition for investors. Absent hard evaluation evidence, we would caution against introducing new sector-specific access to finance programmes, and would instead suggest that the Creative Industries Council prioritises the collection and coordination of investor-friendly financial and economic data.[399]

We have no doubt that the new production tax credits for UK businesses making animations, high-end drama and video games will help level the playing field against subsidised competitors in countries like Canada, France, Singapore, Australia and Ireland and attract inwards investment, in the same way it has done with the film industry. They may also help to stem the brain drain of talent away from the UK in these industries.[400] But, on their own, we do not believe they will help the UK grow creative businesses of the scale needed to reap the biggest rewards in the creative economy (the experience of the British film industry is instructive in this regard).[401] Evidence from Canada suggests that generous subsidies for games development have so far failed to catalyse a strong indigenous games sector – a 2010 report estimated that 90 per cent of the development workforce in Montreal worked for foreign-owned studios, and questioned whether existing schemes were suitable for smaller developers (see Box 7.1 below).[402]

It will also be important to monitor the proposed new tax relief to ensure that it provides incentives for the most innovative businesses, whether these are new ventures or established players who are pushing out the envelope of industry practice, as it is for these businesses our analysis suggests the market failures are greatest. The attention that HMRC has paid to technical points made by the UK video games industry during the consultation about the games production tax credit (in order to avoid unduly favouring developers of packaged games against online and mobile ones) is encouraging in this respect.[403]

BOX 7.1: R&D Tax Credits and Creative Industries in Canada

Canada is perhaps the clearest recent example of how fiscal measures can be used to 'pump prime' the creative economy. Three provinces in particular – British Columbia (Vancouver), Ontario (Toronto) and Quebec (Montreal) – have attracted international attention for their tax credits. The Canadian video games industry has experienced rapid rates of growth (c. 11 per cent per annum), and now employs almost 16,000 people and generates $1.7 billion gross value added, making it the third largest games development territory in the world behind the US and Japan.

Canada's growth story is not just about headline-grabbing tax credits, however. Production tax breaks are one part of a larger ecosystem supporting the video games sector, including R&D tax credits, a strong education system and access to university

research. Telefilm, the national audiovisual agency also administers the Canada Media Fund, which provides finance for the production of interactive digital media content.

Canada's tax breaks extend far beyond video games development into other areas of the creative industries including music and sound recording, book publishing and film and TV production, all areas in which the country has achieved considerable success in international markets. However, it is the very aggressive tax credits for video games production (as high as 40 per cent of labour costs for content production activities in the case of Quebec) which have received most international attention. They are widely credited with having attracted to Canada some of the biggest names in the video games business, including Electronic Arts, Ubisoft, THQ and Warner Bros. These 'anchor' companies have brought with them high profile and kudos (which attracts high-end talent and further investment), but there is also the risk of creating a monoculture dependent on a handful of large companies, and vulnerable to (unpredictable) shifts in market conditions.

Some developers have complained that the existing tax incentives are not always well suited to smaller studios working in newer gaming segments like social and mobile. A recent industry survey, for example, found that a large proportion of respondents felt that government incentive schemes were designed primarily to benefit large developers and publishers. The typical approach is for the tax credits to accrue retrospectively – in other words, the companies must first spend the money and then claim the rebate. Although it is possible to structure accounts in a way such that the tax credit is received in advance, this usually requires accounting skills that are beyond the means of many small developers. As Jens Uwe Intat, Electronic Arts' European Senior Vice-president put it: *"Tax credits are good for people who are good at making money."*

Another feature of Canada's tax credits is that they are only available for creative content development, which excludes the development of Internet platforms. The development of a Canadian Facebook or Google, for example, would not have been supported by the tax credits.

Of course, tax credits have costs for the Exchequer too. There are indications in Canada that the Government is increasingly getting concerned about the country's escalating tax relief bill. Since Prime Minister Stephen Harper took power in 2006, the cost of various tax relief measures has grown by Canadian $20 billion (Goar, 2012). All this while Ontario reputedly granted Ubisoft a Canadian $263 million in tax credits and subsidies in 2009. A recent industry survey confirms that the future tightening of government support is perceived as the third highest risk for the sector, reflecting growing unease about the industry's dependence on subsidies, and raising questions about the long-term sustainability of aggressive fiscal approaches to building up the creative economy.

Sources:

CBC News (2010) 'A missed opportunity: the evolution of video games in Canada.' [online] Available at: http://www.cbc.ca/news/technology/story/2010/09/09/f-videogames-history-part-two.html [Accessed 25 Janaury 2013]

Gamasutra (2010) Interview: Jason Della Rocca on breaking tax breaks' hold. [online] Available at: http://www.gamasutra.com/view/news/29311/Interview_Della_Rocca_On_Breaking_Tax_Breaks_Hold.php [Accessed January 2013].

Goar, C. (2012), 'Tax breaks leave gaping hole in federal budget'. Available at: http://www.thestar.com/opinion/editorialopinion/2012/01/13/tax_breaks_leave_gaping_hole_in_federal_budget.html (last accessed 11 April 2013).

Policymakers should also keep a close eye on recent innovations in capital markets where digital technologies are in some areas beginning to bridge longstanding gaps between supply and demand for risk finance. They should ensure that regulations do not inadvertently get in the way of such market-led solutions to barriers to finance, including crowdfunding,[404] peer-to-peer lending[405] and invoice finance.[406] There are numerous examples of this happening: the Government's policies to encourage risk capital investment in innovation, such as EIS and the Enterprise Management Incentives scheme typically do not apply to financial services firms, nor can ECFs invest in them. Financial regulators are often suspicious of new entrants, creating considerable uncertainty for finance start-ups. Because of the barriers to finance they face, creative businesses are hit especially hard by this regulatory prejudice against new models of finance.[407]

Going beyond this, bodies like the London School of Economics Growth Commission have joined Nesta in calling for any state-backed banks that are set up to channel capital into funding innovation by high-growth businesses.[408] We urge policymakers to include innovative creative businesses in their purview.[409]

PROPOSAL FIVE

Government should ensure that its generic business finance schemes do not discriminate against creative businesses, and that regulations help the development of financial Internet platforms (such as crowdfunding sites). Absent hard evidence on their efficacy, government should resist introducing new sector-specific finance programmes. A higher priority is to coordinate the collection and publication of investor-friendly data through the Creative Industries Council, thus supporting the development of a thicker market for risk finance.

8 ARTS AND CULTURE

1. A mixed economy

The economist John Maynard Keynes, who for the first time placed public funding for the arts on a firm footing through the founding of the Arts Council in 1946, did so not on economic, but cultural grounds:[410]

> *"We are capable of shutting off the sun and the stars because they do not pay a dividend. London is one of the richest cities in the history of civilization, but it cannot 'afford' the highest standards of achievement of which its own living citizens are capable, because they do not 'pay'. If I had the power today, I should surely set out to endow our capital cities with all the appurtenances of arts and civilization on the highest standards of which the citizens of each were individually capable, convinced that what I could create, I could afford..."*

Today, public funding is the cornerstone of the UK arts economy, reportedly providing over half the income of the arts and cultural sector, against the one–third drawn from box office and other commercial income and the rest from sponsorship and donations.[411] There is constant debate about this balance, which is more skewed to the public purse than in the United States and less so than in Germany.[412] The current UK Government stresses the importance of philanthropic contributions,[413] but there is no serious challenge to the thrust of Keynes's argument: public funding of the arts is justified because it delivers a range of public benefits.

The absence of challenge to this orthodoxy appears to reflect public opinion. Ipsos–MORI reports that 24 per cent of the British people are most proud of 'our culture and arts', ahead of 'British sports teams' (10 per cent) and 'British business' (4 per cent), though some way behind 'The Royal Family' (36 per cent) and 'The NHS' (37 per cent),[414] and surveys show a growing level of participation in arts and heritage activities.[415] The BBC, a flagship cultural organisation, has maintained a high level of public trust over many years, in spite of numerous controversies.[416]

It is also true, however, that in recent years economic arguments have become much more prominent amongst UK arts funders. This arises from the growing need to justify arts expenditure against competing priorities in public spending (at a time of fierce constraints).[417] It also recognises the emergence of a substantial commercial arts sector, with the rapid growth of the film, television, radio and recorded music industries and the positioning of these at the heart of creative industries policy in the late 1990s.

2. Economic value and cultural value

Economic arguments for public funding of the arts and culture have had little traction with the UK's cultural leaders.[418] This is, no doubt, partly explained by their distaste for the language of economics ('goods' and 'services') when the decisions of most artists, and the audiences they engage with, are made on aesthetic, emotional, spiritual or intellectual ('intrinsic'), not utilitarian, grounds.

There has been a corresponding unwillingness of economists to engage with the arts and culture. 'Cultural economics' as a discipline languishes in the dreaded category Z 'Other Special Topics' in the Journal of Economic Literature's official classification of economics research. Where there has been work – mostly by economic consultancies who have been specially commissioned to do it, not by independent academics – it has been in the area of 'economic impact': the estimation of the employment and output consequences of specific cultural activities. While a necessary part of the toolkit for policymakers for whom culture is a locus for economic development, economic impact studies do not measure the value of culture, nor do they necessarily provide justifications for why public funding is needed to support it.

One of the few published examples of economic valuation – a contingent valuation (willingness to pay) study of the British Library in 2003 – concluded that 'non-use' values accounted for the majority of the British Library's overall value.[419, 420] Other studies have not addressed questions of valuation using the empirical tools endorsed, for example, by the Treasury Green Book[421] – government's guide to cost-benefit analysis. This contrasts with other complex spheres, such as environment and health, where public economists have successfully attached numbers to the value of goods and services which are not primarily mediated through markets.

Instead, funders in the UK's arts sector have been dazzled by the blizzard of economic impact studies, which use no consistent methodology and are of varying quality of execution. The poorest quality examples have dragged down how the better-executed ones are perceived and, in a variant of the Prisoners' Dilemma, organisations have felt obliged to commission economic impact studies because others have done so. No one has wanted to suffer the disadvantage of lacking impact estimates. But when the numbers haven't stacked up in aggregate,[422] the outcome has been that the intended audiences – most obviously those in charge of funding – have not believed the results.[423] Prisoners' Dilemmas can only be resolved by decisive leadership, which has to date been lacking. The dearth of rigorous economic valuation studies in the cultural area has left the arts open to judgments expressed in crude instrumental terms, of a kind that Keynes would have abhorred.[424]

Why have things been different in environment and health? We suggest, because there has been more determined and imaginative leadership. The publication in 2011 of the UK's National Ecosystems Assessment[425] was a groundbreaking independent and peer-reviewed quantitative analysis of the value of the UK's natural environment and the services it provides. This offered an evidence base using the full panoply of techniques that economists use to value public goods, including contingent valuation and subjective wellbeing. The assessment was the outcome of a wide-ranging partnership of government departments and agencies, local government, NGOs and research councils. Credit also goes to the House of Commons Environmental Audit Committee which, in 2007, called for this radical assessment.

Here is an opening for the AHRC's new project on cultural value. Under the leadership of Professor Crossick, it has set out *"to clarify research-led understanding of an area often dominated by assertion"* and to understand *"a complex problem too often oversimplified."* The AHRC, announcing the project, added: *"It is widely understood that culture brings considerable economic benefit to the UK, including the arts and creative industries. But there is also widespread agreement that to understand these benefits in economic terms alone is to miss some of the most important contributions that the arts and culture bring to individuals and society. The challenge is to develop additional perspectives that are persuasive in method and offer compelling detail and substance."*[426] This is a most welcome initiative and one which will require inter-disciplinary thinking on a considerable scale.[427]

There is need for rigorous research too in the area of spillover benefits of public arts and culture spending to the commercial creative industries and vice versa. Ed Vaizey MP, who

has been the Minister in charge of the arts and creative industries throughout the life of the current UK coalition government is one who frequently draws attention to this symbiosis:

"I firmly believe that the lines will continue to blur between what we consider the art ecology and the creative economy,"[428] he wrote in a foreword to an Arts Council of England report which itself set out to define *"an approach that invests in the interface between the arts ecology and the creative economy."* This report goes on to acknowledge that *"there is now increasing recognition that the flows or value chains linking the various elements within the arts sector are more nuanced and complicated"* than sometimes portrayed.[429]

The purpose of this chapter is not to analyse these linkages per se[430] or to debate the overall level of funding. As noted earlier, the latter is dictated as much by judgements about cultural value (which lacks a common unit of measurement) as economic. Our own sympathies lie strongly with Keynes's view that the non-monetisable societal benefits justify healthy levels of public funding for the arts. But we also believe that where economic justifications are given for public funding they should be made on the basis of economic valuation, not just assessments of economic impact, and that much greater efforts need to be made to understand the relationship between economic and cultural values.

Instead, and consistent with the broader thesis of this manifesto, we explore the response of arts and cultural organisations to the emergence of digital technologies so that we can understand whether a better led and managed response might add value not only to the contribution made by the arts themselves, but across the wider UK creative economy. Based upon previous Nesta studies, we argue that the cultural sector has an 'innovation problem' with regard to digital, but that there are good examples of peer-to-peer learning and a number of useful initiatives from which further innovation can develop.

3. Innovation: a problem and an opportunity

There is no doubt that the emergence of the Internet and associated digital technologies impinge upon the world of the museum, the library, the theatre, the opera house and the art gallery in as wide a variety of ways as they do upon commercial creative businesses, with the important difference that a publicly funded business model, like that of the Royal Opera House or the BBC, is less vulnerable to the convolutions of online advertising which have so disrupted commercial media business models.

In other respects, the threats and opportunities are connected, though not identical. Digital technologies potentially transform access to the arts as they do to commercial published and recorded works, but art forms where the core product is live performance appear to be less at risk of cannibalisation of audiences than record companies and book publishers.[431] Cultural institutions such as art galleries and museums which have online exhibitions are likely to find these recruit, not cannibalise, attendances at physical exhibitions.[432] Many arts and cultural organisations will share the concerns of commercial firms about online copyright infringement, but not all are heavily focused upon protecting intellectual property. Libraries and other memory institutions campaign for easier access to 'orphan works' and other 'rights-bound' troves in their care because easy digital access supports their mission to spread knowledge. That is why libraries have found themselves at loggerheads with commercial players, as in the dispute between the British Library and News Corporation about access to news archives or between libraries and book publishers about the loan terms for e-books.

The BBC enjoys a unique position in these matters. It has a big interest in protecting its rights and in making commercial returns from its rights in overseas markets and through re-packaged programmes (for example in DVD format) in the UK. It also supports in very

substantial ways the music industry, especially with regard to classical music.[433] At the same time, the BBC feels a responsibility to take advantage of digital technologies to make available to licence fee payers, and to some extent to a wider international audience, its abundant archives. In laying down the terms for a new ten-year Royal Charter and Agreement for the BBC in 2006, the Government introduced a novel, sixth 'purpose' for the Corporation, which states that the BBC should also *"in promoting its other purposes, help to deliver to the public the benefit of emerging communications technologies and services and, in addition, take a leading role in the switchover to digital television."*[434]

Viewed from a narrow perspective, this may be seen as one of a succession of moves to 'salami slice' the BBC's licence fee income to fund other media projects on the political agenda; but, potentially it opens up a wide vista of possibility in which the BBC might play a pivotal role in ensuring that the UK's content creation and publishing strengths are exploited to their maximum public value advantage in a digital world otherwise dominated by commercial platforms. This concept, sometimes referred to as the 'Digital Public Space' (see Box 8.1 below), will require clear leadership from the BBC Trust, the new Director General of the BBC, Lord (Tony) Hall and his Director of Strategy and Digital, James Purnell, if it is to succeed.

BOX 8.1: The Digital Public Space

Since its foundation in 1922 the BBC has accumulated over 1 million hours of programming with supporting documentation, 6 million stills and the world's largest collection of sheet music.[435] The BBC has long recognised the huge potential for digital technologies to unlock the value of this archived content and to make it available for the benefit of those who paid for it through the licence fee. In 2004, the BBC looked to a *"future where the public have access to a treasure trove of content, a store of value which spans media and platforms, develops and grows over time, which the public own and can freely use in perpetuity."*[436] At that time the BBC saw itself as moving into a 'second phase of the digital revolution' (the first one being about distribution, mobility and increased consumer choice), where the rapid growth of broadband and video on demand would ensure the public had *"access to previously closed archives at zero or low cost".*

Ten years on, the vision has evolved into the model of the 'Digital Public Space' which envisages an open, non-commercial, Internet-hosted platform, supported by the BBC and a coalition of other publicly funded archive owners from around the UK, such as the BFI and the British Library, and designed to make the UK's vast digital archives available to everyone in a quality-assured environment. There is also potential to co-operate with Europeana,[437] a European-wide digital archives project and other international initiatives such as the Digital Public Library of America.

The ambition behind this project speaks of a curated Internet space which eschews aggressive acquisition and manipulation of personal data and excludes advertising. For commercial participants, the Digital Public Space would offer an environment in which rights-protected material would be safeguarded by the provision of clear terms of trade and which would, it is hoped, offer an environment friendly to experimentation and innovation. Following the BBC World Service model, the Digital Public Space would also aim to make services available internationally, providing a non-commercial global platform model for access to high-quality digital content.

The Digital Public Space would establish interoperability of standards and other working links with the Digital Copyright Exchange/Copyright Hub proposed in the

Hargreaves Review of Intellectual Property. Procedures to arbitrate differences over questions of rights ownership, for example, could be shared between the Digital Public Space and the Copyright Hub.

A very small-scale pilot for the Digital Public Space already exists in the form of The Space (thespace.org), a BBC collaboration with Arts Council England to develop a cloud-based Internet platform that gives audiences access to digital arts programming and related content. *"A six month experiment in delivering digital art to audiences",*[438] the sharing of technology and development of digital production skills through the project have been as important to the project as the impact on audiences (as of January The Space had attracted over 1 million visits from 630,000 unique visitors).[439] The pilot phase ended on 31st March, and is now being evaluated with a view to establishing an ongoing service.

In this manifesto, we argue that the Digital Public Space initative should lie at the heart of a renewed BBC commitment to digital technology, consistent with its obligations under its sixth digital public purpose.

Sources:

http://www.guardian.co.uk/media/2009/apr/20/bbc-archives

http://downloads.bbc.co.uk/aboutthebbc/policies/pdf/bpv.pdf

http://www.europeana.eu

http://www.bbc.co.uk/blogs/aboutthebbc/posts/one-square-at-a-time

http://www.guardian.co.uk/media/2013/jan/06/bbc-digital-public-space-archive.

(All sources last accessed 11 April 2013).

Three years ago, Nesta published a study of innovation in the cultural sector based upon detailed research involving two of the UK's leading cultural organisations: the National Theatre and the Tate Gallery.[440] It sought to clarify what is meant by innovation in an arts and cultural context and identified the response to digital technologies as a central, cross-cutting theme. The resulting study focused upon four areas of potential innovation: audience reach, artform development, value creation and business model innovation.

It found, in the case of National Theatre, that live broadcasts of plays to cinemas achieved a striking extension of audience. This larger audience included a significant minority of people who were not regular National Theatre-goers and whose incomes were lower than those attending live performances in London, thus suggesting an attractive digital route to serving a more diverse audience. There was no evidence that the cinema shows cannibalised the live theatre audience: on the contrary, the live broadcasts appeared positively to recruit audiences to the theatre by tapping into the local audience networks of digital cinemas. The Tate, regarded as a leader in the use of digital technologies in the art world, was presented with evidence which allowed it to quantify the benefits of online access to exhibitions, showing that, as with the NT, the Tate's online audience was more diverse in terms of ethnic identity and income levels than those who attended exhibitions in person.

On the theme of advancing artforms, the study provided indicative insights about the relative levels of emotional engagement of cinema and theatre goers in the experiment, so challenging assumptions that in the flesh 'live' is necessarily always most engaging. With regard to innovation in value creation, the research explored 'willingness to pay' and 'willingness to donate' for the virtual experience of a gallery exhibition, adding insight to voluntary and crowdfunding methods.

The study concluded that digital technologies *"are bringing new audiences to arts and cultural organisations ... creating new sources of cultural and economic value and in some cases taking the artform itself in new directions."*

The momentum created by this and other experimental studies led to the decision by the Arts Council of England, the AHRC and Nesta to fund a £0.5 million pilot digital R&D Fund for the Arts and Culture in England, subsequently followed by a three-year scheme (2012-2015) with over £7 million to distribute. The England pilot attracted 495 bids.[441] Creative Scotland, the AHRC and Nesta followed up with a pilot fund for Scottish arts and cultural organisations.[442] A fund in Wales is planned. The Creative Industries Innovation Fund in Northern Ireland is exploring related territory, although this initiative is not exclusively focused on arts and culture and is not research-led.[443] Six themes have been selected as priorities for the digital R&D funds: user-generated content and social media; distribution; mobile/location issues; data and archive; business models and resources; and education.

National Theatre Live, meanwhile, has continued to grow, with seven cinema broadcast projects in the 2011/12 financial year, contributing an audience of over 800,000, against a worldwide paying audience of 2.3 million. In commercial terms this remains small compared with the impact of, say, the global commercial success of the NT's production of War Horse, which contributed over one fifth of the company's income – itself a powerful confirmation of the porous boundary between the arts and the commercial creative economy.[444]

There are many other useful and inspiring examples of big digital projects. The BBC's coverage of the 2012 Olympic Games, richly exploiting broadcast and web-based platforms to offer a diversity and depth of content, was a striking example.

Many smaller arts organisations are also vigorously pushing the boundaries of digital. National Theatre Wales (NTW), a company with no fixed physical base and formed only in 2010, has put at the core of its mission engagement with audiences through a combination of online social media and on the ground collaboration with communities to establish physical audiences in scattered performance sites. NTW's street performance of The Passion in Port Talbot, starring Michael Sheen and webcast live, was widely hailed as an artistic and social triumph, which also yielded numerous benefits, including a boost for the 'hyperlocal' Port Talbot Magnet news service created by journalists following the closure of the local newspaper. Wales, however, also provides illustrations of the difficulties arts organisations encounter in dealing with digital. Audiences at the Torch Theatre in Milford Haven, one of the most remote cultural centres in the UK, can today enjoy live digital performances from the New York Metropolitan Opera, but not from the Cardiff-based Welsh National Opera due to a mix of contractual issues and institutional lack of will.

A broader indication of the limitations of the arts' response to digital opportunity is laid out in an online profile of what were then Arts Council England's 869 regularly funded organisations (2009). This found that 94 per cent of these organisations were using online resources only as a marketing tool; a scant 4 per cent were judged to be offering some form of self-standing online experience.[445] *"For most arts organisations (and certainly most of those who are about to become Arts Council national portfolio organisations) digital has not yet fundamentally altered their core practice or business model,"* the report concluded.[446]

How can arts organisations get better at digital innovation? The most likely route is by a judicious blend of guidance and incentives from funders, along with improved networks to support peer-to-peer learning. A strong culture of research and experimentation, in business models as well as approaches to production and creativity, will be needed to nourish improved structures and networks.

Not Rocket Science (2009) proposed a significant publicly provided fund for arts R&D, made available to organisations with the capability to deliver it and conditional upon open dissemination, analogous in the minds of the authors to the distribution of publicly funded radio and television programmes by public service broadcasters.[447]

This related to an earlier provocation from John Knell, an experienced arts consultant, who urged the many foundations, trusts and philanthropists giving money to the arts to band together around a compact designed to achieve higher standards and mutual learning to support *"a long-term vision of the type of arts and cultural ecology they are trying to create and how they might do that better together."*[448]

Accomplished management of digital 'cultural data' also offers potentially high returns to arts organisations.[449] Well mined social networks data, for example, can contribute significantly to understanding of audiences, to building community, new business models and to measuring intangible assets like reputation, through social analytic tools such as Klout and Kred.[450] Funders can use this 'data 3.0' or 'data-driven decision-making' approach to improve the information base for investment decisions. *"The current policy approach to the use of data in the cultural sphere is out-moded and inadequate. Considerable financial and other benefits are already failing to accrue as a result".*[451]

Recent research by Nesta, looking at data analytics in UK businesses more generally, finds *"a visible data dividend"* for the minority of companies making a heavy investment in online data. Almost a third of businesses in the information and communications sector are identified as heavy adopters (versus less than a fifth across the whole sample) and they use digital data for text and data mining, forecasting, digital dashboards, market segmentation, market testing and price-setting.[452]

4. Conclusion

After years of unproductive debates where cultural and economic values have been pitched against each other, it is time to accept that the arts do produce value that can be meaningfully assessed, and measured, by economists, but that they of course produce cultural value which cannot be expressed in monetary units.[453] Funders need a much better understanding of the relationship between these economic and cultural values, not least because in some cases the former – which can be measured – may do a very poor job at signalling the latter.

The arts and cultural sector is an essential part of the UK's creative economy. But as we enter the third decade of the digital revolution, most UK arts funders and arts organisations are well behind the technology curve. To catch up, they need to experiment more and ensure that, as far as possible, the results of that experimentation are accurately logged and shared. As part of this, like other businesses, arts organisations need to understand their data resources and develop the skills to exploit them. This work should be a priority for the Arts Councils, the Research Councils and arts organisations in the coming years.

Leadership will of course come from many different parts of the cultural sector. But the BBC is uniquely well placed, and resourced, to help build this culture of shared experimentation.

PROPOSAL SIX

The Treasury and the DCMS should undertake a broad-based assessment of the value of public arts and cultural spending in the UK, drawing upon similar work on the natural environment and the Cultural Value Project of the Arts and Humanities Research Council. Funding decisions should be justified in the light of criteria that emerge from this work.

PROPOSAL SEVEN

Funders should incentivise experimentation with digital technologies by arts and cultural organisations and allocate a sustained percentage of their resources to digital R&D, ensuring that the evidence arising from this work is openly shared. Under its new leadership, the BBC should publish in 2013 a strategy to reflect its Digital Public Purpose in the period to 2018, not least through the ambitious vehicle of its Digital Public Space initiative.

9 COMPETITION

The history of the creative economy abounds with charges of anti-competitive behaviour: from the 1938 Paramount decree that vertically disintegrated the Hollywood studio system to the unease between games developers and Nintendo in the 1980s and 1990s.[454] In the second digital decade, Microsoft became a high profile target of anti-trust authorities on both sides of the Atlantic, following its 'browser wars' with Netscape.[455] More recently, Google has found itself the target of European and American competition authority scrutiny. Meanwhile, and most directly relevant to this manifesto, widespread disruption to creative business models has raised new challenges for those charged with ensuring fair play in creative markets.

While it is hard to overstate the importance of these issues for the ability of the UK's creative economy to innovate and grow, their complexity and scope means that they are often paid less attention than they deserve. In this chapter, we tackle them head-on, without forgetting their connections with other important areas of policy like intellectual property, privacy, data protection and plurality. We first consider how market power can arise on the production side of the creative economy, before turning to questions of distribution, including the role of Internet platforms[456] such as Google, Amazon, Apple and Facebook in creative markets.

Our assumption throughout is that open, contestable markets, subject to clear and well-informed supervision on competition grounds, are essential for a successful UK creative economy. While we acknowledge that the Internet is a great generator of innovation and competition – and contend that, to this day, its markets remain broadly contestable – we do not agree with those who appear to assume that this will always necessarily be the case as a consequence of the Internet's architecture. This raises the question of whether the UK's competition machinery is sufficiently well adjusted to identify and address abuses of dominant position that may emerge in digital markets. Our answer is that further adjustment is needed.

In considering new ideas, we need to bear in mind the context of European law, within which UK competition rules sit. We must also bear in mind that a major set of institutional changes is already under way in the UK, with the creation (from 2014) of a unified Competition and Markets Authority (CMA), subsuming the top tier competition roles of the Office of Fair Trading and the Competition Commission. The CMA has indicated that it will seek stronger relationships with specialist economic regulators like Ofcom, which has competition authority in the UK's communications markets, as well as other regulatory powers relevant to the creative economy.[457]

1. Production

Policymakers setting the rules for competition authorities seek the right balance between static efficiency (the conditions of 'perfect competition' where markets deliver efficient outcomes) and dynamic efficiency (because the promise of profits arising from market power is what spurs business to innovate). Market power can however become entrenched when incumbents restrict or co-opt entrepreneurial entrants; or even contagious where it spreads across interconnected markets – a real concern in a digitally converged creative

economy. In some creative markets there is an additional issue: democratic societies require that news media are not dominated by too narrow a set of perspectives or interests. This 'plurality' issue has been the source of much debate in the UK in recent years, chiefly around News Corporation's large holdings in national newspapers and pay television – a debate intensified by last year's revelations to the Leveson Inquiry into press ethics about the scale and persistence of the Murdoch group's influence on Ministers.

Two essential features of creative markets that we have already discussed explain the historical recurrence of concerns about excessive market power in the creative economy; first, the intangible, informational nature of creative products, and second, unpredictability about the demand for them.

The 'informational' aspects of creative products mean that once the first, costly copy has been produced, the marginal cost of making additional copies is low and, some argue, almost zero. This means, in principle, that there are few technological limits to the supply of creative goods, or the scale of the businesses that produce them.[458] The low cost of reproducing creative products also underpins arguments for Intellectual Property Rights (IPRs) – copyright, patents and design rights – that offer temporary monopolies to enable commercial exploitation in creative markets and so incentivise further creativity.

On the demand side, as we have discussed in Chapter Seven, consumer (and business) interest in creative products is often driven by unpredictable, fast-changing tastes and fashions, giving an advantage to those players in the value chain – traditionally, large publishers and studios – that are able to spread risk over a portfolio of projects.[459] These businesses also manage demand for their creative products by investing heavily in marketing and, in some cases, exerting control over distribution.[460] In the extreme, market dominance can give rise to dubious practices, such as exclusivity deals to restrict competition and payola in radio.[461]

The consequences of these microeconomic features of creative industries are well known: they give rise to a relatively small number of 'gatekeepers' who select and fund creative goods supplied by independent companies and talent. The Hollywood studios' market share of the UK film box office was 60 per cent in 2011.[462] The four major music labels between them controlled 75 per cent of the global music market in 2012[463] – the same market share as that of large publishers in the UK consumer books market in 2011.[464] Three companies – Sony, Microsoft and Nintendo – between them control the global video games console market, and games publishing is also highly concentrated. Even in UK creative service markets like advertising, a relatively small number of large groups such as WPP and M&C Saatchi account for a large share of markets.[465]

Concentration of power on one side of the bargaining table generally means weakness on the other: consider the up-and-coming band amongst a thousand others in relation to a large music label or an established music streaming service.[466] Or the budding novelist handing a first manuscript to a publisher. This inequity in bargaining power explains why individual creators often struggle to capture the value generated from their creative work. Royalties can be low and opaquely distributed by collecting societies about which their members have too little accurate information, and many creators relinquish their intellectual property on disadvantageous terms, resulting in 'IP poverty traps'.[467] Studies show that few authors earn significant incomes from copyright.[468] Where they can, the most successful artists can take publishing matters into their own hands, as the Beatles did in creating Apple Records.

2. Distribution: networks and 'tipping markets'

Digitisation has made the distribution of creative content and services more dependent on a telecommunications infrastructure which has itself in the last three decades moved from being dominated by public sector utilities to being somewhat less dominated by a privatised version of such utilities (BT in the UK), along with more recent players in fixed and mobile provision. Those policies that influence market structure, investment and prices in telecommunications markets also affect many aspects of the creative economy, not least by shaping the ability of telecoms companies to act as gatekeepers into creative markets.

In the UK, content businesses do not have to pay these companies (Internet Service Providers or ISPs) a fee to access consumers – an aspect of 'net neutrality', discussed further below. ISPs are, however, able to manage traffic to allow differentiated quality of services for different types of Internet traffic, for example, to prioritise delivery of a managed video-on-demand service which requires a guaranteed picture quality. While such traffic management may support new services to consumers and also protect a specific consumer experience, there are concerns that it may also give ISPs power to engage in anti-competitive practices, for example blocking their rivals' content, such as Internet-based video-conference or 'telephone' services like Skype.

Then there are Internet platforms. As explained in Chapter Four, digital technologies have lowered the fixed costs of creative production, storage, reproduction and distribution, enabling the emergence of strong Internet platforms with unparalleled reach, such as iTunes, the App Store, Facebook, Amazon or Steam. Concerns are frequently expressed that these platforms may themselves present a problem of market dominance: Amazon's global market share of the e-book market is over 60 per cent;[469] in 2009, Amazon controlled 18.2 per cent of the entire US e-commerce market.[470] iTunes controls 70 per cent of digital music sales in the US (and just under a third of all music sales);[471] in 2011, Steam enjoyed over 50 per cent of the PC download market, while Google earns 48.5 per cent of the world's online advertising revenues and accounts for more than 90 per cent of Internet searches in the countries of the European Union.[472] Online news markets also exhibit high levels of concentration (as well as a close relationship to their offline counterparts).[477]

One reason for this market dominance is the network effects in Internet platform markets that we described in Chapter Four, which can create 'winner takes all' situations (also called 'tipping markets'). In the absence of diversity in demand for different platforms, or of easy interoperability between them, consumers and business competitors can find themselves, at least in the short term, facing unacceptable levels of market power.[474]

Another reason is the existence of consumer switching costs and lock-in, where users make investments that are exclusive to the platform and cannot be 'exported' to competitors – such as their links with friends in a social network, or a catalogue of video game content for a console. The evidence suggests consumers mostly do not exercise the option to switch even in markets where they are readily able to do so, as it is with broadband suppliers,[475] where a regulator like Ofcom seeks to ensure that switching terms and options are simple and clearly visible.

In spite of all these potential sources of market power, the UK's specialist communications sector regulator Ofcom operates on the principle of *"a bias against intervention"*[476] in markets, in the belief that naturally occurring competitive forces will usually safeguard the interests of consumers. There are good reasons for thinking that competition does indeed assert itself in Internet platform markets despite the microeconomic features discussed above.

Foremost among these is that providers in one platform market may enter another and harness the same network effects that previously had protected the incumbent, reducing the latter's market power. Internet platforms frequently use such 'envelopment' tactics against each other.[477] So, Facebook (with Graph Search) and Apple (with Siri) are developing new forms of search, whilst Google's Android competes in the mobile phone business and secures premium entertainment content to strengthen YouTube's market position with regard to video services which have stronger roots in television and film. An envelopment strategy was also famously used by Apple when it moved from devices into content distribution and by Amazon in the opposite direction with its Kindle reader.[478] Providers can also use mergers and acquisitions to gain a foothold in new Internet platform markets, especially when they have the cash stockpiles many do. Google has bought more than 100 SMEs since 2001, including 26 in 2011 alone.[479, 480]

In the last three years, the spotlight of competition policy authorities on both sides of the Atlantic has shone on the activities of these powerful Internet platforms. In the e-books market, Apple has been accused of colluding with book publishers to fix the price of e-books, but subsequently reached agreement with the competition authorities on remedies which stopped short of fines.[481] Writers and publishers have raised concerns about Amazon's plans to buy the right to use .book as a web domain name.[482] Google has been the subject of major examination by competition authorities in the United States and Europe. Google's critics say that it has abused its market power in search, for example by diverting traffic in ways designed unfairly to benefit itself.

Both the American and European competition authorities must form judgments on the extent to which consumer interests are jeopardised or enhanced by Google's market power and in January 2013, the US Federal Trade Commission gave Google search a more or less clean bill of health on this specific charge,[483] prompting Joaquin Almunia, the EU Competition Commissioner, who has led the European investigation, to counter-assert that in Europe Google is indeed taking unfair advantage of its dominance in the European search market (at over 90 per cent, this compares with about 65 per cent in the US).[484] In theory, the European Commission has the power to fine Google up to 10 per cent of its revenues if it confirms abuse of market power, but the signs recently have pointed towards an informal settlement. Mr Almunia himself has hinted that this is likely to involve voluntary adjustment of Google's business practices, rather than the more radical option of seeking changes to the operation of the American company's search algorithm.[485]

Undeterred by these developments, other European Governments have taken more particular matters into their own hands. In Germany, Chancellor Merkel proposed but then appeared to draw back from legislation which would require Google to seek permission from news organisations to link to their news snippets: an attempt to extend copyright in order to redress the loss of revenues suffered by newspaper companies as a result of Google's free online news aggregation services. While this risks the charge of imposing copyright at the cost of diminished freedom of expression, not to mention at the expense of innovation, the move struck a chord in other capitals. Amid signs that the French Government was considering its own version of this move, Google recently agreed to pay €60 million into a fund designed to help French publishers develop their own Internet business models.[486, 487] No equivalent action has yet been mooted in the UK, though Google has been an energetic investor in favoured government growth schemes, such as Tech City in London, which it no doubt considers part of its ongoing negotiation of a 'licence to operate' in the UK, where a number of large American corporates have been under pressure on general issues, such as their liability to UK taxation.

All of this adds another layer of complexity to the European debate about the future of copyright, which we discuss in Chapter Ten. Google is frequently accused by rights holders of failing to recognise its market power in helping to block the activities of 'pirate' purveyors of music and other rights-protected content.[488] In the UK, the 2010 Digital

Economy Act put pressure on ISPs to play a larger part in dealing with these breach of copyright issues, whilst also giving Ofcom new powers to enforce a code of conduct on such matters, along with requirements to assess Internet traffic management patterns and to report regularly on the state of the UK's communications infrastructure. This is a good example of the ways in which the role of a competition regulator's remit has been stretched in response to developments in digital markets. Google, meanwhile, has attempted to take some heat out of the situation by stepping up the volume of its 'take-downs' on YouTube and adjusting its search algorithms, though not to the extent sufficient to placate its critics.[489]

It is evident from these examples in e-books and search that Internet platform markets can be challenging to evaluate from a competition perspective. Routine features such as high switching costs and market practices like price discrimination may in fact be consistent with well-functioning markets if, for example, consumers obtain upfront a clearly explained discount to access a platform which the providers later recoup through higher prices.[490] At the same time, abuses of dominant position may occur even in situations where ostensibly the price customers are charged for digital content or services is zero and competition is just 'a click away.' Facebook, for example, is able to harvest its customer data for commercial gain without charging its users. In the UK, regulation of issues around data privacy is primarily the concern of the Information Commissioner's Office, with limited 'concurrent' powers held by Ofcom with regard to data protection issues in some areas, but excluding the activities of websites. This opens up an area of risk: that the regulatory system may be insufficiently informed and alert to market power issues arising around the control of 'Big Data', which has been called 'the crude oil' of the digital economy,[491] but which also raises highly sensitive privacy issues.[492]

3. Competition policy in Internet platform markets today

Analysing market power issues in the creative economy compares in both complexity and importance with the fast-changing global markets in financial services, where the UK also has an unusually prominent interest at stake and so plays a highly energetic role in seeking to ensure that at the European and global level UK business interests are taken into account in decisions about regulatory design. Given the importance of the UK's creative economy, we suggest that an equally committed approach is in order.

An effective system requires a well-structured and well-managed top tier authority, the role specified for the new Competition and Markets Authority, along with a level of more specialised economic regulation, provided in the case of communications markets via the concurrent competition powers held by Ofcom. Given the dramatic effects of digital technologies upon markets in the creative economy, it is timely to ask, however, whether Ofcom has the authority and expertise to meet the needs of the creative economy in full.

Ofcom's sector-specific powers, like other specialist economic regulators in fields such as energy and water, are designated 'ex ante' and designed to promote competitive outcomes in telecommunications and broadcasting markets where there is a tendency towards over-concentration, with the recognised risk of monopoly pricing and restricted public access to vital services. Ofcom also enforces the rules which govern consumer switching between broadband suppliers, with a view to reducing switching costs and promoting competition in the retail broadband market. Ofcom's general duties, meanwhile, require it to pay attention to the interests of citizens, as well as those of consumers, reflecting the civic and social issues at stake in vital services like broadcasting and telecommunications. This combined consumer and citizen aspect is even more strikingly relevant with regard to the Internet, where issues of privacy, free speech and access to public services are increasingly tied up with every individual's online quality of life.

Ofcom's broadcasting industry powers rest upon its award and supervision of licences (e.g. for ITV and other broadcasters), enabling it, for example, to enforce rules determining relative prominence on the TV electronic programme guide (the 'channel changer') and to adjudicate on complaints about programme content, usually with regard to 'taste and decency.' An important adjunct to the broadcast regime makes the BBC Trust responsible for approving applications for new BBC services, which may include online offerings. As part of this procedure, Ofcom is responsible for assessing the potential market impact of new BBC services.

In contrast, the UK's generic competition regime is 'ex post', meaning that it is reactive, seeking to address and remedy problems in markets after they have been found to occur, with the burden falling on the competition authorities to show that competition law has been broken. Concerns about price fixing in the e-books market, for example, were initially raised in the UK by the Office of Fair Trading,[493] before being subsumed within the European Commission investigation referred to above.

As noted in Chapter Two, when Ofcom's powers were set out in the 2003 Communications Act, some argued that the new, converged regulator should be given a wider range of responsibilities and powers with regard to the Internet, both in terms of the working of online digital markets and to address a range of social concerns, such as the protection of minors and rights to privacy. The Blair Government decided, however, that the risks of over-regulation of the Internet outweighed the potential benefits of a more comprehensive approach. Ten years later, we believe that it is time to revisit this sensitive topic, in the context of the Communications Bill planned for 2013/2014.

Any change in UK law, however, requires consistency with European law, which currently rests principally[494] upon three main pillars: the European Convention of Human Rights;[495] the EU's E-commerce Directive established in 2000;[496] and the framework for telecommunications regulation, which was most recently updated in 2009.[497] In its day to day work, Ofcom works within a college of European communications regulators (The Body of European Regulators of Electronic Communications or BEREC) which seeks to ensure that European regulators act consistently within the agreed legal framework.

The core objectives represented by these three pillars are as follows:

- The Convention of Human Rights protects free speech and privacy (themselves often in tension with each other).
- The E-commerce Directive says that telecommunications carriers have only very limited liability for the content their networks carry (the 'mere conduit' principle).
- The Telecommunications Framework proceeds from the principle of 'open network provision,' requiring providers to offer acceptable levels of service to everyone, but without discouraging telecommunications companies from pursuing commercial deals which support further investment in their own infrastructure and so result in wider benefits. A central goal of the framework is to encourage innovation.

The UK's 2003 Communications Act reflected, as it was obliged to, the thinking of the E-commerce Directive that telecommunications companies should enjoy limited liability with regard to the content, effectively in exchange for investing in networks.

Ofcom's translation of the more recent EU Telecommunications Framework is set out in its own 'Approach to Net Neutrality' published in November 2011.[498] Here, Ofcom highlights its view of the Internet as a platform for innovation and other significant enhancements to the welfare of consumers and citizens, and proposes an approach which seeks to hold in balance permission for infrastructure owners to deliver 'managed services' (for example

in Internet TV) and a commitment to 'best efforts' in assuring an open, congestion-free general network. Through this approach, Ofcom seeks *"a virtuous circle ... associated with a period of intense and highly productive innovation."*

In the event that proliferation of managed services were to damage the quality of the online experience more generally, Ofcom says it *"would need to consider intervening in order to ensure that consumers and citizens continue to benefit from the widespread innovation that has delivered such significant benefits since the Internet's creation. We might do so by using the powers which allow us to safeguard 'best-efforts' access to the open Internet, in particular by imposing a minimum quality of service on all communications providers."*

Mindful of its 'bias against intervention', however, Ofcom adds that *"we should be able to rely on the operation of market forces to address the issues of blocking and discrimination."* Ofcom promises to keep these matters under review, citing new legal requirements (in the 2010 Digital Economy Act) for it to monitor the effect of traffic management on the "best efforts open Internet" and to support a new three-year reporting commitment on the state of the UK's electronic communications infrastructure.[499]

4. Competition policy in Internet platform markets tomorrow

So, where, if any, are the gaps or potential gaps in this complex armoury of the UK's competition authorities with regard to the activities of Internet platforms in the creative economy? Outside Google search, which the European Commission is investigating, are there market practices in Internet platform markets which do in fact discriminate against the UK's creative businesses?

It is not difficult to see continued potential sources of friction: Apple's market power in the distribution of music and apps; Amazon's power in the retail distribution of books and e-books and concern that Facebook's commercial use of personal data might raise economic as well as personal privacy issues. In a digital world, none of these is a purely UK matter and none is subject to only UK-level jurisdiction, but the potential impact on UK creative businesses is clearly substantial.[500]

As already noted, the overwhelmingly loudest complaint from creative businesses about Google is its alleged complicity in online infringement of copyright. The concern is that Google especially, but also Apple, has no business reason to be concerned passionately about the spread of copyright piracy. Apple's business depends primarily upon the sales of devices, not content; Google's business depends upon its dominance in search. The resulting copyright wars, between rights holders on one side and ISPs and Internet platforms on the other, are discussed in detail in Chapter Ten.

These were the forces which, in the UK, led to the 2010 Digital Economy Act (DEA), which was intended to balance the interests of rights holders and ISPs, but which was severely amended during a rushed Parliamentary passage. As a result, the patchwork that is UK competition policy for the creative economy acquired more patches, including some not well designed for the job in terms of website blocking. Ofcom was handed an important role in drawing up and enforcing a code of practice, intended to make it easier for rights holders to assert their rights. Ofcom also got new responsibilities to monitor ISP traffic management and the state of the country's communications network. Suddenly the regulator – funded in large measure by telecommunications companies (the ISPs) – was drawn into the middle of the most divisive issue in the creative economy in circumstances where Internet platforms are not subject to Ofcom's ex ante powers.

Subsequent to the DEA, the Hargreaves Review of IP made three further proposals which impinged on the supervision of competitive creative markets:

- that, in spite of the delay in bringing the DEA into force (due to challenge in the courts), Ofcom should immediately start to gather reliable information about online rights infringement, in order to provide a firm evidence basis for the design of effective enforcement mechanisms;[501]

- that the Government should facilitate, but not direct, a new Digital Copyright Exchange (subsequently carried forward as the Copyright Hub project by Richard Hooper) to make paid access to licensed material much easier and so to make rights infringement less attractive to consumers and small businesses;[502]

- and that the Government should establish a clear mandate in law for the Intellectual Property Office (IPO) with regard to competition and market issues (subsequently reflected a memorandum of understanding between the IPO and the OFT),[503] so that issues such as the shortcomings of collecting societies and the particular needs of small firms in creative markets might receive the timely attention they deserve.

Standing back from this account of regulatory and competition policy issues, two points emerge. First, it is difficult to argue from the evidence, including major competition authority investigations in the US and Europe, that there is yet hard evidence of consumer detriment in markets where Internet platforms play a major role. In those circumstances, we believe, any proposal to design ex ante powers for a specialist regulator to deal with Internet platforms would be tantamount to over–regulation, with potentially high risks to the sorts of digital innovations (and therefore consumer benefits) we discussed in Chapter Four.

It is important, however, to reiterate that we reach this conclusion on a pragmatic reading of the empirical evidence that is publicly available, rather than on theoretical arguments like those deduced from the benign or generative nature of the Internet.[504] Yet, it is difficult to avoid the conclusion that there is a growing gap in UK policymakers' ability to keep abreast of the complex range of issues in play. In other words, while it appears that, as of the time of writing, Internet markets remain broadly contestable and innovative (not least because of the dynamics of 'envelopment' between platforms we highlighted above), policymakers should not assume this will always be the case; they need to keep a finger on the pulse of competition in these Internet markets, which requires an institutional framework able to generate timely evidence to inform action. Any 'evidence vacuums' that exist will be inevitably filled with ad hoc reviews and initiatives. In the six years to 2011 there have been four such involving intellectual property issues alone. Given the importance to jobs and prosperity of the UK creative economy, the uncertainty that this creates for businesses is surely unacceptable.

So, what should be done? We believe that the UK needs a coherent point of authoritative expertise on competition and related market issues arising from the Internet, and its impact on the creative economy. The obvious lead organisation here is Ofcom, which has already developed much relevant expertise, but which lacks authority to gather information in some Internet markets and which should be encouraged to draw attention publicly to shortcomings in the way these markets are working, from the perspective of consumers and citizens and to track new developments.[505] It is worth adding that an ambitious non–commercial proposal, like the BBC's Digital Public Space, a publicly funded Internet platform which we discussed in Chapter Eight, would also require market assessment by Ofcom.

With these points in mind, the Government should place at the heart of the Communications Bill planned for 2013/2014, a section which consolidates within Ofcom

lead responsibility for understanding competition issues arising from the effect of the Internet on UK consumers and citizens and which gives Ofcom the authority to undertake the research and collect the data necessary from Internet platforms and other creative businesses, building upon its current work programme in support of enforcing copyright online.[506] There is useful potential synergy here in the design of the proposed Copyright Hub and its supporting mechanics, for example on arbitration of disputes. Ofcom's general duties should be broadened to include responsibility for advising government of the actions needed to ensure a flourishing, open Internet, balancing the interests of consumers and citizens and committed to supporting innovation and economic growth.

In order to address these expanded responsibilities, Ofcom will need to work closely with a number of other agencies. It will, as a matter of course, need to cooperate on many fronts with the CMA, whose own work will benefit greatly from Ofcom's enhanced level of expertise on the Internet. But Ofcom will also need to coordinate with agencies like the Information Commissioner's Office on data protection issues; with the IPO on copyright and other IP issues; and with the law enforcement authorities on matters concerning cyber–crime.

As a first step in establishing the detailed scope of this new approach, Ofcom should be asked to undertake a Strategic Review of UK citizens' and consumers' experience and expectations of the Internet, with a view to informing its advice to government. This review, like all of Ofcom's work, should pay close attention to national, regional and local differences within the UK.

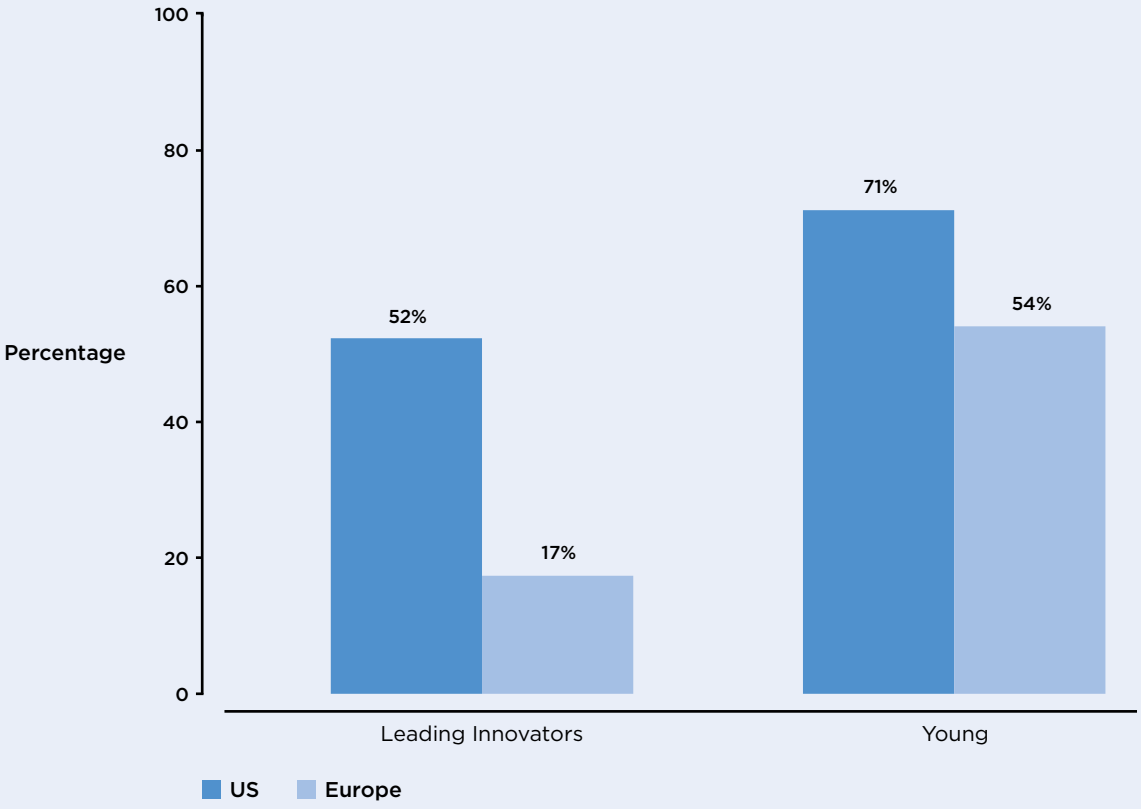
There seems to be some acknowledgement of the points we have raised in Ofcom's annual plan for 2013/14, where it says: *"On public policy issues, we anticipate that Ofcom's working relationship with the Government will continue to be fluid, ranging from supporting to implementing specific policies as defined by Parliament. It is for the Government to decide how far regulatory policy should and could be used in support of wider government growth and innovation goals. This can affect specific policies in a number of areas, including competition and spectrum, as well as specific issues such as network neutrality and the creative economy."*[507]

It is, indeed, for the Government to decide. We urge Ministers to acknowledge that the current piecemeal approach in the UK to competition issues arising from the Internet is not good enough and that it is time to take the next step. It is not an unreasonable hope that a better informed debate will be a calmer one, where constructive engagement between content interests and technology companies will gradually displace the trench warfare of recent years.

BOX 9.1: The US/Europe Internet Platform Puzzle

The lack of leading British Internet platforms parallels a wider European phenomenon. A comparative study of the US and Europe's information and communication technologies (ICT) sectors, led by Brussels–based think tank Bruegel, uses 2008 data from the European Commission's Institute for Prospective Technology Studies (IPTS) to show that the US accounts for a far higher proportion of the world's leading innovative ICT firms than does the EU (52 per cent compared with 17 per cent, Figure 1). In addition, the US innovative ICT firms are much more likely to be younger than their EU counterparts, with 71 per cent of US ICT innovators and 54 per cent of European ICT innovators being young.

Figure 1: Innovative companies in the US and European ICT industries



Source: Bruegel (2008) based on the IPTS scoreboard. ICT Leading Innovators in a region are all ICT firms that are in the top 1000 R&D spenders according to the IPTS Scoreboard. Leading Innovators in a region measures the proportion of overall ICT Leading Innovators in the IPTS R&D scoreboard of 1000 top R&D spenders emanating from that region. Young firms are those that were established after 1975. Young measures the proportion of overall ICT Leading Innovators in a region that are young.

Moreover, it seems that Europe's strengths are in ICT areas with less potential for future growth – hardware and telecommunications. By contrast, the US has far more leading, younger innovators in Internet platform segments where so great a deal of value is captured (Table 1).

Table 1 Distribution of ICT companies by layer and region

		US		Europe	
		% ICT firms	% Young	% ICT firms	% Young
Layer I	Telecom	13	74	12	28
	Semiconductors	33	73	14	75
	Computers	15	60	12	57
	Electronics	10	29	19	45
Layer II	Telecom operators	1	0	18	20
Layer III	Internet	4	100	0	0
	Software	24	86	24	86

Source: Bruegel (2008) based on the IPTS scoreboard. Young firms were established after 1975. Leading innovators measures per cent of ICT companies included in the IPTS R&D scoreboard in each of the regions.

The reasons for this 'platform puzzle' are complex – the Bruegel report attributes them to a lack of a single integrated digital market in the EU, fragmented IP policy, access to finance and skills problems, lack of an entrepreneurial culture, few strong ICT clusters and limited government action to build early demand for new technologies: many of the issues that our manifesto focuses on.

Source: Veugelers, R. (2012) 'New ICT Sectors: Platforms for European Growth?'

PROPOSAL EIGHT

Ofcom should be given powers to gather information in all Internet markets in order to maximise the chances of sound and timely judgments about the emergence of potentially abusive market power and other market concerns (an 'early warning system'). Ofcom should contribute a regularly updated strategic overview of these issues, working closely with the Information Commissioner's Office, the Intellectual Property Office, the Competition and Markets Authority and other relevant agencies. Ofcom's remit should be broadened to advise the Government on the actions needed to ensure the UK enjoys a flourishing, open Internet, balancing the interests of consumers and citizens and committed to supporting innovation and growth. These changes should be a central feature in any Communications Bill planned for 2013/14.

10 COPYRIGHT WARS

Copyright has been at the centre of the political battleground of the UK's creative economy for more than two decades, as rights holders have successfully sought stronger enforcement of laws offering copyright protection for greater lengths of time in a period when digital technologies have made the practicalities of enforcement of any rights a lot more difficult. A countervailing case for less onerous or more flexible copyright law has been made by advocates of an 'open Internet', who argue that over-zealous copyright protection threatens freedom of expression and undermines new forms of collaborative creativity made possible by digital communications technologies, with consequent damage to innovation, economic growth and cultural potential.[508] Consumers, caught in the middle, are confused: the evidence suggests that most people break some aspects of copyright law routinely, that consumers frequently find it difficult to distinguish between legal and illegal material and that pragmatic rather than moral considerations govern many downloading decisions. There is, however, no clear-cut evidence of growing, generalised disrespect in principle for the rights of creators and owners of creative works to be paid for their work.[509]

The economic purpose of intellectual property (IP) laws is to protect rights of invention (patent), creative expression (copyright) and authenticity (trademark) in order to provide incentives for more invention, creativity and trade. Design rights, a patchy set of provisions by comparison, extend a version of this approach to economically important design activities. In all areas of IP there is controversy – in patents, proliferating awards are said to cause 'thickets' which impede rather than support innovation – but in the creative industries, the threat to copyright has dominated the policy agenda, even though many creative companies have successfully adapted their business models to deal with ease of copying in a digital world.

This chapter proposes a peace settlement in the copyright wars that re-establishes copyright in a form comprehensible to digital era consumers and enforceable by rights holders, but which avoids mission creep into other, growing, 'non-expressive' areas of the economy.

1. From Berne to Pirate Bay

It was in 1886, at the height of British political and economic global power, that the Berne Convention provided the first truly multilateral agreement on automatic copyright[510] (offering rights protection to creators for the author's life plus 50 years). Although Britain had been a pioneer in defining the rights of authors from the Statute of Anne in 1707, it took a century for the UK and the US fully to embed Berne in national statute. For long periods, some countries, including the United States, refused to recognise the copyright of foreign creators.

From the 1960s, however, rights holders were able to feel with some confidence that things had changed; they could look forward with enhanced confidence to extracting rent from international markets, but they were also aware of threats from new copying technologies: starting with the audio cassette in the 1960s and the video recorder in the 1970s. In 1982, Jack Valenti, the most notable of Hollywood's many political lobbyists, told Congress that

"the VCR is to American film producers and American public as the Boston Strangler is to the woman home alone."[511] Note the scale of claim to a general public interest as well as a corporate one. It did not take long, however, for enterprising companies to work out how to make money first from video-cassettes and then from DVDs.[512]

By the second half of the 1990s it was clear that the VCR's threat to rights holders was a Disney fairy tale compared with the horror story emerging from the world wide web. As the web progressively gave consumers the ability to copy and transfer across the globe files containing first music, then books and newspapers, followed by television programmes and films, these content industries found themselves subject to a truly violent disruption of business models. With the VCR, Jack Valenti could at least appeal to American patriotism against a technology threat from Japan. The Internet set one business cluster on the California coast against another.

For a generation of liberal American intellectuals,[513] this battle touched the founding principles of the Republic, with the Internet promising to embed principles of freedom of expression for the 21st century and copyright, in its ambition for expansion, apparently threatening this. Advocates of the open Internet, of open source software and the Creative Commons in publishing[514] connected with an ambiguity in American thinking about intellectual property protection and innovation reaching back to Thomas Jefferson's optimism about the cost-free nature of the transfer of good ideas between human beings.[515] Out of this emerged the 'fair use' principle, which informs US IP law and permits individuals and companies to make use of rights-protected material, subject to the risk of challenge through the courts.

In all of this, the UK was largely in reactive mode. Although a UK scientist, Sir Tim Berners-Lee, invented the world wide web, the architects of Creative Britain in the late 1990s reasoned that as the home of Europe's largest concentration of creative industries, and specifically of content creators in Europe, the UK national interest lay in defending and extending copyright.

It is the contention of this manifesto that this narrow focus, though well-meaning and based upon a plausible definition of UK economic self-interest, has contributed to a broader defensiveness with regard to the potential of digital technologies, which is one cause of the innovation problem we identify in some parts of the UK's creative economy. If UK policymakers had been less inclined to rely so heavily upon the perceived benefits of promoting ever stronger IP rights, perhaps they would have focused more effectively upon other aspects of the innovation 'system' vital to a strong creative economy – such as research and development support (Chapter Six), access to finance (Chapter Seven), competition policy (Chapter Nine) and education and skills (Chapter Eleven).

2. IP, innovation and growth

The detailed case for IP reform on grounds of innovation and UK economic performance is set out in the Hargreaves Review on Intellectual Property and Growth,[516] which was commissioned by Prime Minister Cameron in October 2010 and published its conclusions in May 2011. Its foreword summarises the argument and its implications for the UK creative industries as follows:

> *"Copyright, once the exclusive concern of authors and their publishers, is today preventing medical researchers studying data and text in pursuit of new treatments. Copying has become basic to numerous industrial processes, as well as to a burgeoning service economy based upon the Internet. The UK cannot afford to let a legal framework designed around artists impede vigorous participation in these emerging business*

sectors. This does not mean, however, that we must put our hugely important creative industries at risk. Indeed, these businesses too need change, in the form or more open, contestable and effective global markets in digital content and a setting in which enforcement of copyright becomes effective once more."[517]

The review invited government to ensure the following:

- that decisions on IP rights are taken in the light of the best available economic evidence;
- that the institutions involved in administering and supervising the IP regime hold appropriate mandates, including with regard to competition, thus implying modified powers for the IPO and Ofcom, and clear standards for the operation of collecting societies;
- that creative businesses be incentivised to develop more effective digital platforms for licensing content (through a 'Digital Copyright Exchange');
- that the UK takes advantage of flexibilities in the European IP framework, for example to legalise the transfer of rights-protected files from one personal device to another, in order to bring copyright in line with reasonable and routine digital era consumer behaviour;
- that steps be taken at the UK and European levels to ensure copyright does not interfere with the growth of copying for 'non-expressive' purposes, including the use of text and data mining;
- that the UK play its part in encouraging the development of a 'Digital Single Market' in Europe, to facilitate trade in digital goods and services, along with the completion of a 50-year process to establish a unitary European patent jurisdiction;
- that better account be taken of the needs of SMEs in all areas of IP law, particularly with regard to low-cost dispute resolution and access to IP information services;
- that serious problems facing archives and museums with regard to their management of digital archives and 'orphan works' (where the rights holder is unidentified) be resolved;
- that steps be taken to ensure that the growth in patent issuance is not associated with a growth in corporate techniques for blocking innovation.

In August 2011, the Coalition Government declared the review's call for a more adaptive IP framework to be *"fundamentally the right view"*, with a potential gain to UK economic output of between 0.3 and 0.6 per cent of GDP by 2020, along with a reduction of deadweight costs in the economy of over £750 million.[518]

Stakeholder assessments of the Hargreaves Review divided along familiar lines: scepticism about reform from many rights holders and enthusiasm from some technology companies and educational and research institutions. Some leading rights holders, however, accepted the case for improved licensing procedures, and collaborated with the feasibility study of the Digital Copyright Exchange undertaken by Richard Hooper along the lines suggested in the review.[519] The first phase of this work confirmed the existence of *"significant problems in a range of market segments and industry sectors"* and the final report set out the practical steps needed to create a *"not for profit, industry-led, Copyright Hub"* able to stimulate competitive markets in *"the very high volume of automatable, low monetary cost transactions coming mostly from the long tail of smaller users."*[520]

In late 2012, the Government introduced the Enterprise and Regulatory Reform (ERR) Bill,[521] a diverse legislative vehicle which included measures to open up access to orphan works and to improve standards among collecting societies. Subsequently, the Government published a detailed list of new exceptions to copyright, in line with flexibility offered under the EU legal framework, with the objective *"to make the UK a better place for consumers and for firms to innovate, in markets which are vital for future growth."*[522]

3. Towards a new compact

Where is all of this leading?

At the time of writing, UK Parliamentary consideration of the Government's reforms is well advanced, but still incomplete, and there remains a threat of legal challenge to the mechanics of change proposed in the ERR Bill. Given the history of Parliamentary resistance to reform, it would be rash to conclude that the Government's reforms will be accepted in their entirety. It is also fair to say, however, that the twin-track approach to copyright advocated in the Hargreaves Review – greatly enhanced access to digital licensing by the 'long tail' of smaller users, along with reforms designed to have copyright law make sense to people – appears to have struck a chord, not only in the UK, but also in Europe, and places as diverse as Canada, Brazil, Russia and Singapore. This shift in the debate probably reflects three things: a recognition among creative and other businesses that the Internet's effects, however painful, call for radical adaptation rather than denial; the emergence of a 'born digital' generation of voters (and behind them, their more anxious parents) prepared to support change; and the impact of a long period of economic stagnation since 2008, which has underlined the need to generate jobs and prosperity in sectors like the creative industries, where the UK has a long-established comparative advantage.

Indicators of this shift are visible all over the world. In the US, the Wikipedia et al. Internet shutdown in January 2012 led President Obama to withdraw support for two pieces of legislation (SOPA and PIPA)[523] which would have increased online copyright enforcement powers. In July 2012, the European Parliament voted overwhelmingly to block the ACTA[524] treaty, which would have consolidated a range of IP enforcement tools, but which was targeted by campaign groups resisting constraints on the working of the Internet. The following month, Aurelie Filippetti, the new Socialist Minister of Culture in France pledged to curtail the activities of the Hadopi law enforcement operation, a seemingly strong version of *"three strikes and you're out"* pursuit of copyright infringers introduced in 2009 by President Sarkozy.[525] The Minister criticised the high cost of Hadopi and said that it had *"not fulfilled its mission."*[526]

The European Commission, meanwhile, a staunch defender of an ever more onerous copyright regime for the last two decades, has started to shift its own position, promoting a cautious liberalisation of access to orphan works, along with rules requiring more transparent operation of copyright collecting societies.[527] All of these European moves reflect a growing awareness that without a 'Digital Single Market' Europe[528] will further darken its already gloomy economic outlook. This focus upon the economic potential of digital technology also explains the firmness with which the European authorities have sustained their commitment to the principles of net neutrality in the most recent revision of the European Telecommunications Framework.[529]

In December 2012, President Barroso himself launched an initiative on copyright reform based upon the expectation that Europe's digital economy *"is expected to grow seven times faster than overall EU GDP in the coming years."*[530] President Barroso called for a major round of stakeholder dialogue in 2013, to be followed by evidence-based legislative changes in 2014. In the same week, Michel Barnier, Commissioner for the European Internal

Market, made a speech launching 'Licensing Europe,' an initiative which echoes in some respects the Digital Copyright Exchange concept set out in the Hargreaves Review and which aims to ease the difficulties of rights licensing across member state boundaries,[531] though some critics say that this initiative is being used as a device to avoid copyright adjustments, for example those needed to boost text and data mining.[532]

Ireland, holder of the Presidency of the European Union in the first half of 2013, favours copyright reform. Richard Bruton, Minister for Jobs, Enterprise and Innovation, said: *"a further and very important IP objective during our Presidency is that of moving forward the debate in the field of copyright to ensure that this is fit for purpose to meet the needs of the digital age for businesses and consumers alike. It is clear that the digital revolution is fundamentally changing the way in which business is being conducted and that European copyright legislation must evolve in response to that change."*[533, 534] It also appears likely that Ireland will preside over agreement to a unified European Patent Court, an initiative which has taken no less than 50 years to bring to fruition.[535]

The case for bold reform in Europe is also surely enhanced by the recent call by Maria Pallante, the Register of Copyrights of the US, for a comprehensive modernisation of US copyright law in 'the next great copyright act.' She told the Judiciary Committee of the House of Representatives that under current arrangements: *"authors do not have effective protections, good faith businesses do not have clear roadmaps, the courts do not have sufficient direction, and consumer and other private citizens are increasingly frustrated."* The issues are numerous, complex and inter-related.[536]

Meanwhile, there has also been some movement from the other side of the corporate argument on copyright enforcement. In August 2012, Google agreed to co-operate with long-running rights holders' demands to downgrade in its search rankings the websites of persistent, commercial-scale copyright infringers,[537] though some rights holders have continued to complain about the seriousness with which Google is taking action.[538] In February 2013, as mentioned in Chapter Nine, Google agreed to pay €60 million into a French media fund designed to help French news publishers adapt to the Internet,[539] following a move in Germany (subsequently softened) to require Google to remunerate providers of news to which the search company provides links.[540]

A different type of indication of the adjustment of positions in global copyright wars can be seen in recent books from the opposing trenches. Here are the closing words of William Patry, Google's Senior Copyright Counsel, in *How to Fix Copyright*:

> *"Going after the very small number of those who are doing most of the harm [in terms of copyright infringement] is entirely justified. What is unjustified are heavy-handed techniques against the mass of the population, whether through three-strikes-and-you're out approaches, or threats of lawsuits with crippling penalties. Copyright owners have all the tools they need to go after the bad guys and we should support them in those efforts. However, copyright owners should also support the good guys by providing reasonably priced convenient authorised goods. If they don't, no copyright law can help them."*[541]

And here is Robert Levine, in *Free Ride: how the Internet is destroying the culture business and how the culture business can fight back*, a book which argues that the Internet is in danger of destroying the creative industries with its disruption of business models:

> *"Copyright laws do need to be revised to bring some order to the Internet; we need shorter terms of protection, a way to take quicker action against commercial-scale pirates, and less draconian damages for individual infringers."*[542]

4. The peace dividend

So perhaps it is time to imagine what might a digital-friendly UK and European copyright regime look like? It could:

- provide fair incentives to creators, small as well as large, without heavy transaction costs so that they can use the returns earned on their IP to invest back into their creative work;
- liberate digital archiving and provide access to orphan works, hugely enriching Europe's available cultural resources and generating many new business opportunities;
- encourage new analytical techniques based upon text and data mining and so strengthen our science and creative base;
- facilitate the emergence of new content businesses, including those based upon 'user-generated content' and collaboration;
- enable Europe to adapt to as yet unknown digital technologies without going into a political spasm on each and every occasion;
- enable children to grow up in digital schools, where they can be well-educated in the workings of a clear and rational copyright system (as well as in creative subjects and computer science – see Chapter Eleven);
- make legitimate and effective the punishment of commercially motivated pirates;
- nurture a European Digital Single Market, bringing serious benefits to content producers of all kinds and, perhaps, at last, stimulate the emergence of a new generation of European technology companies.

In these circumstances, there is no reason why a fair-minded copyright enforcement regime cannot be made to work. The key to getting it right is to gather the information needed to understand consumer and business behaviour and to ensure that significant wrongdoers are the main target. Given the enhanced powers to gather information granted to Ofcom under the Digital Economy Act of 2010, along with the research undertaken on online infringement as a result of the Hargreaves Review, the UK is now in a position to enter this era of smart enforcement.

Meanwhile a sustained approach to digital licensing, coupled with a reformed copyright regime that makes sense to digital era citizens, holds out the genuine prospect of an end to the copyright wars, putting the UK and European creative economies on the path to greater prosperity.

PROPOSAL NINE

UK copyright rules and exceptions should be re-balanced, along the lines proposed by the UK Government, and also at the European level as part of the drive for a European Digital Single Market. A new mechanism for enabling vastly increased and more efficient rights licensing transactions (through the proposed Copyright Hub) should be further developed during 2013, again with potential European replication.

11 SKILLS AND EDUCATION

Our definition of the creative economy emphasises its reliance on creative talent as the primary source of value. It follows that a growing creative economy needs an expanding creative workforce. In fact, we know that growth in the demand for skilled creative workers in the UK's wider economy has outstripped that even in the creative industries in recent years.[543] We also know from a long body of research on technology adoption and skills that information and communication technologies (ICTs) complement the non-routine problem-solving and complex communications tasks that are associated with creativity.[544] Separately, there is evidence that firms also reap greater benefits from ICT investments when they have stronger management practices.[545]

This suggests that creative, ICT and management skills are three core ingredients of a thriving creative economy.

Historically, the UK has benefited from an education system that has been reasonably well disposed towards producing talent with this skills mix, at least in the first two areas; it has had art and design schools which place emphasis on allowing individuals to pursue their own ideas alongside the development of their technical skills, strong university computing departments, and a long tradition of vocational training in key craft areas.[546] Where demand has outstripped supply, the UK has been able to rely – at least until recently – on attracting skilled talent from overseas, enabled by a relatively permissive immigration policy.[547]

But today, in the UK there is an alarming mismatch between the supply and demand for creative skills, with severe skills shortages precisely in the Internet-related areas where UK businesses need to compete. This includes the technical skills needed to use digital content creation tools and to design digital platforms, the management skills to implement new production processes based on iterative learning and data, and the entrepreneurship skills to give birth to the next generation of start-ups that will shake up Internet markets.[548]

Nesta gathered very clear evidence of this problem in its *Next Gen* skills review led by Ian Livingstone and Alex Hope, in 2010, when more than half the video games and visual effects companies surveyed reported difficulties in filling entry-level positions: employers identified vacancies for people with technical skills, expertise in digital platforms, and management and production skills as particularly hard to fill.[549] The strong backing for the review's recommendations from the likes of Google, BT, Facebook, The Guardian and Talk Talk confirmed that these concerns went well beyond the video games and visual effects industries.

Consistent with this, a 2010 survey by Creative Skillset, the Sector Skills Council for the creative media industries, showed that 56 per cent of interactive media companies – including those in mobile content, Internet protocol TV and social media – struggled to find candidates with the right creative team-working, software and management skills.[550]

Compounding these problems in recruiting new talent, creative employers also face gaps in the skills of those they currently employ. For example, one-third of video games companies surveyed for *Next Gen* reported that their workforce needed an upgrade in its skills. Over a quarter of the interactive media companies surveyed by Creative Skillset revealed skills

gaps in their workforce. And a third of digital entertainment companies in Brighton's digital cluster say that a lack of management skills in their workforce creates significant barriers to growth.[551]

This picture of severe skills shortages and gaps is also echoed in creative industries that are not 'born digital', such as film, publishing and advertising. There, disruptive technologies have also given rise to new skills needs. As Creative Skillset's report, *Labour Market Intelligence for the Film Industry* points out, *"A key skills gap for the future, common for the film industry, is new and digital technology and particularly managing the change from traditional to digital media."*[552] In 2009, 46 per cent of advertising companies surveyed by Creative and Cultural Skills reported skills gaps in their workforce. More recently, advertising employers have also complained of shortages in multi-platform skills.[553] A worrying two-thirds of publishing companies surveyed by Creative Skillset in 2011 reported gaps in the sales and marketing skills of their workforce, and half mentioned shortcomings in their employees' technical skills in areas like computer programming and web design. More than a third complained about a lack of business and leadership skills.[554]

The evidence is beyond doubt: digitisation has exposed creative, technical and management-related skills deficiencies in the UK's creative workforce that demand urgent attention if its creative businesses are in the future to succeed in Internet markets.

In this chapter, we consider in more detail the needs of today's and tomorrow's creative workforce and propose remedies to deal with blockages.

1. The right stuff: attitudes, skills and knowledge requirements of a high-quality creative workforce

Creativity is sometimes described less as a skill and more as an attitude or way of thinking. This echoes the 'interpretative' innovation capability outlined by Richard Lester and Michael Piore at the Massachusetts Institute of Technology.[555] They describe this as a willingness to try new things and to embrace ambiguity, which relates to our discussion in Chapter Three about the importance of meeting customers' differentiated needs in a way that cannot be precisely expressed in advance.

But they also stress the importance of brokering ideas across disciplinary boundaries: interpretative innovation involves exploration with a wide variety of collaborators which is *"more appropriate when the possible outcomes are unknown – when the task is to create those outcomes."*[556] Thus, we can view the creative process as multi-disciplinary and one with entrepreneurship at its heart.[557] Study after study shows that even the most original, surprising and radical creative outputs involve the synthesis of ideas from domains, creative fields or disciplines further afield.[558]

Posing unexpected questions and sketching possible answers, however, are by themselves not enough: craft and technical skills are needed to realise most creative ideas. This might be designing and implementing the features for a web service or video game, or writing the brief for an advertisement, shooting a film or producing an album. Although many of these skills build on theoretical knowledge (e.g. mathematics in the case of computer programming or ergonomics in the case of design), they also involve an important tacit element that cannot be taught in abstract, instead requiring 'learning by doing' in real-world situations.[559] When applying their craft skills this way, creative professionals build upon existing knowledge, learn quickly and think originally to address new problems and explore unexpected creative avenues.[560]

Multitudes of different crafts skills and disciplines come together to generate creative products.[561] Even making a short film usually involves dozens of specialist crafts, from scriptwriting and photography to acting and visual effects production. Video games studios bring together computer programmers, digital artists and designers. This means that creative professionals need strong 'soft skills,' including team working and communication, to collaborate with colleagues from other disciplines, and to perform effectively as part of project teams that come together for a limited period of time to deliver a film, a music album or an advertising campaign.

In this intensely multi-disciplinary environment, professionals with the right fusion of creative and technical knowledge and skills are at a high premium. Alex Hope, Managing Director of Visual Effects studio Double Negative, describes his dream hire as someone with 'Double Maths, Physics and Art' A-levels.[562] In a similar vein, video games studio Valve exclaims in its Handbook for New Employees that *"Engineers: coding is only the beginning; Non-engineers: program or be programmed."*[563] The continued growth of embedded creative jobs outside the creative industries adds another dimension to this required multi-disciplinarity.

Managers of creative businesses these days are required to have particularly strong project management skills, given the scale and complexity of many creative projects. The production of the blockbuster video game Assassins Creed III, for instance, involved more than 600 developers working across seven studios in America, Europe and Asia.[564] And visual effects companies now have asset pipelines spanning the globe – when work finishes in one part of the world, it starts immediately in another. Live shows deploying advanced visual effects are at the heart of the very large and growing Chinese market for public festivals and globally for corporate events; firms serving these markets have learned their trade in the music and theatrical performance businesses.[565]

As with all businesses, general business skills – accounting, finance, planning and marketing – are also an essential part of the mix. Historically, there have been some concerns about the quality of these business skills in the UK's creative industries. Surveys have suggested that worryingly large numbers of UK creative businesses lack even basic business planning skills.[566]

Last but not least, successful creative careers are built upon adaptability – a crucial quality for learning. As the American designer Charles Eames put it, long before the turbulence of the digital era: *"if nothing else, a student must get from his training a feeling of security in change."*[567]

Why this adaptability is essential now should be clear from the impact that digital technologies have had on what is required from creative workers, which in some cases has caused wholly new occupations to emerge, and rendered others obsolete. Animation, film, television production have all, for example, been transformed by Computer-Generated Imagery (CGI). Changes in business models and the reconfiguration of creative value chains have forced creative firms to acquire new capabilities and skills in areas as wide-ranging as software development, community support, 'Big Data' and the management of virtual economies. In the analogue age, most content businesses had only to worry about producing great creative content, and left the commercialisation to their publishers. But with digital technologies, many are now learning how to market, publish and distribute by themselves, with a geographic horizon extending across continents.

The Internet and digital technologies also offer new opportunities, venues and modes for learning for creative professionals. Hyper Island, set up in Sweden in 1994, but with a global presence today, offers experiential learning.[568] More recently, there has been a surge of 'Massive Open Online Courses' (MOOC) such as those provided by Coursera, EdX and Udacity. Although MOOCs have their critics,[569] they open up lectures from prestigious

universities to global audiences, while providing interactive testing facilities and forums for group discussion. In January 2013, Coursera already boasted 2.4 million users and 214 courses (including in subjects like 'Creative Programming for Digital Media', 'Gamification', and 'Digital Sound Design') from universities like Georgia Tech, Duke and Princeton.[570] In December 2012, the UK's Open University announced FutureLearn, a MOOC provider in partnership with 12 UK universities.[571]

Stack Overflow, a 'question and answers' site mostly focused on computer programming, is another prominent example of an online innovation with the potential to overhaul how creative professionals acquire and update their skills.[572] And then there are the plethora of affordable production tools, in some cases open source, and in others commercially developed but freely available for non–commercial activities (such as games engine Unity 3D), which budding and veteran creative professionals can use to learn new skills and improve existing ones.

2. Why are the skills needs of the creative industries not being met?

Where are the weaknesses in the UK's providers of education and training to explain the alarming picture that opened this chapter?

Schools

Schools teach young people 'core' knowledge and skills that act as a gateway, foundation and spur to further learning. They also provide information and inspiration about potential careers, helping students choose the right subjects to pursue in secondary school and through further and higher education. Are they currently doing this in a way that reflects the needs of the creative economy? We do not believe that they are – either in terms of what is being taught or how it's being taught.

Over the last decade England's primary schools have been required to focus on teaching core subjects like English, science and mathematics on the grounds that without satisfactory performance in these areas, pupils will be at a lifelong disadvantage in terms of their platform for building other forms of knowledge and skills. One consequence of this focus, however, is that other subjects also vital to the creative economy have become optional appendices to the school curriculum. These subjects have included computer science, design & technology, and art.

We are delighted that Michael Gove has belatedly responded to the Next Gen Skills campaign by agreeing to include a GCSE in computer science in the English Baccalaureate, which since 2010 has been used to measure and signal the performance of English schools, and therefore shapes schools' incentives to invest and prioritise its resources.[573] But we believe the continued exclusion of art and design and technology is a significant threat to the UK's creative economy.

Mr Gove's decision on art and design & technology has been challenged by three Reviews – *Next Gen, Restarting Britain* (produced by the Design Commission)[574] and the independent *Review of Cultural Education* by Darren Henley.[575]

Next Gen's recommendation that art be included in the English Baccalaureate was developed further in the Henley Review as part of a comprehensive programme of change in the provision of arts and cultural education in schools.[576] Although Ministers responded warmly to the review's less important points, they ignored its central thrust, to the dismay of groups campaigning for a stronger commitment to creative subjects at the core of

the English education system.[577] There were similar concerns that the Government was not heeding the warnings of the Design Commission's call for design education not to be sidelined in schools.[578]

These critiques of government policy are today shared by the Creative Industries Council Skillset Skills Group, which brings together figures from across the creative industries and which in January 2012 made a series of recommendations to the UK Government's Creative Industries Council. The group observed that: *"much of the curriculum and teaching in schools has become too focused on what can be easily taught and examined rather than what gives children and young people the deep skills and emotional connection to a subject on which they can build."* It argued for a more balanced multi-disciplinary approach to the curriculum, one which combines the *"artistic interests, technological innovation and entrepreneurial energy which is so distinctive of the UK's creative and digital industries and which underpins its competitive advantage."*[579]

This concern with the way students are assessed and the need for a more 'fused' artistic, technology and entrepreneurial education brings us to problems with *how* subjects are taught in schools. In his 2011 MacTaggart Lecture at the Edinburgh International Television Festival, Google's Executive Chairman, Eric Schmidt criticised the UK's education system for forcing young people to specialise too soon in either STEM or arts and humanities subjects, thus reinforcing the gap between the 'two cultures' identified by C.P. Snow more than 50 years earlier. This premature specialism, he argued, diminished the UK's ability to educate the 'polymaths' who have one foot in digital technology and the other in design and the arts that the creative economy needs. *Next Gen* had, for example, gathered survey evidence that young people, presented with this dichotomy, were being fooled into thinking that they didn't need to acquire hard science qualifications in order to pursue a career in high-tech creative industries.[580]

Schools are also being criticised for failing to harness the pedagogical potential of digital technologies in the classroom (or failing to provide evidence of this) despite substantial cash investments.[581] The sheer pace of technological change has created a chasm between those who design and deliver the curriculum and those who receive it – the first generation to grow up in a world with pervasive Internet access, and as such, often more proficient with digital technologies than their teachers.[582] This has led to calls for a more imaginative deployment of technology in the classroom.[583] A recent international review by Nesta uncovered over 200 examples of digital innovation in education and concluded that while *"digital technology offers enormous potential to transform learning"*, there had been too great an emphasis on kit in the classroom and too little consideration of learning aims and teacher capabilities. (Box 11.1) The relatively slow technology uptake in UK schools, this study argued, also reflects a widespread lack of confidence about managing the 'dark side' risks involved in embedding digital technologies within schools.

BOX 11.1: Creative Technology in Education

Nesta's *Decoding Learning* report uncovers many international examples of innovative use of digital technology in educational settings, but concludes that too often the interest is driven by technology rather than learning outcomes. The report calls for greater connection between researchers examining the use of technology and assessing outcomes, the firms that develop technologies and applications for learning, and the teachers themselves.

While it is difficult to identify a single nation that has fully harnessed the potential of digital technologies in educational settings, there are lessons to be learned from ongoing initiatives and programmes across the world.

iZone is a community of innovative **New York schools** committed to delivering more personalised learning to their students. New technology is central to the approach, but the starting point is always the learning needs of the students. Participant schools identify their key learning challenges, pilot and evaluate the impact of innovations on student achievement and actively share their findings with teachers and educational technology developers. There is a strong focus on online and blended (that is, online and face-to-face) learning, and on combining different learning modes in the classroom – such as live teacher-led instruction, collaborative learning, self-directed learning (sometimes using bespoke software solutions) and virtual tutors.

Maths students at **The School of One** (also in **New York**) begin each day in front of a large screen that generates a 'playlist' of activities for that day. This is a highly tailored learning programme generated by computer algorithms that take account both of the learning stage of each student and their preferred learning style. So, for example, a student who responds well to computer-mediated learning might start with a range of computer-based tasks, while another may go for one-to-one tutoring with a teacher. The model reduces the time that teachers need to spend on administration, freeing up time to get to know the students better. Evidence from a summer school pilot suggested that students following the School of One model learned maths faster.

In **Singapore**, the education system is highly centralised and the use of educational technologies is controlled by the Government. Educational products need to comply with Ministry of Education guidelines on learning outcomes, and their developers work very closely with teachers and schools to pilot products before they can be launched in the market. The perception is that this close connection between developers and teachers helps adapt technologies to the classroom. Schools are also allowed to proceed at their own pace when adopting these new technologies. Some make only minimal use of new technologies while others are far more involved.

Bearing this in mind, one of the educational platforms more widely used in Singapore schools is LEAD. It includes interactive tutorials, games, exploration activities, and assessments in all subject areas, and allows teachers to create customised learning packages that can be assigned to students online. Teachers can also include resources such as YouTube videos, chat capability, links to websites, Google Docs, and files they have created. They can also track students' progress online.

New digital technologies can empower students to take greater responsibility for their own learning, shifting away from conventional 'broadcast', linear models of education. **The Orestad Gymnasium** in **Copenhagen** uses a broad range of technologies to do just that, giving students a high degree of autonomy over where and when they work, and over how they demonstrate their learning. Podcasts, for example, are used to combine text, sound and narration and help less confident students demonstrate their abilities in areas like languages without the pressures of a traditional classroom environment. Smart phones are used as tools in lessons and the school's virtual learning environment allows students to upload their work for assessment.

This flexible approach is also reflected in the design of school facilities, with large open areas for collaborative working. Students are to a large extent in charge of their

own learning and teachers adopt more of a mentoring role. The school has achieved impressive results. Despite the fact that almost half of the students at Orestad come from families with no history of further education, the school achieves results on par with national averages in terms of progress to further and higher education.

Sources: Nesta (2012) 'Decoding Learning: The Proof, Promise and Potential of Digital Education.' [online] London: NESTA. Available at: http://www.nesta.org.uk/areas_of_work/public_services_lab/digital_education/assets/features/decoding_learning_report. Accessed 28 January 2013.

The Daily Riff (2012) 'E-Learning in Singapore: Where Teachers are Involved in Product Development.' [online] Available at: http://www.thedailyriff.com/articles/e-learning-in-singapore-where-teachers-are-involved-in-product-development-927.php [Accessed Feb 2013].

The net result of all these shortcomings is that young people find themselves living in a digital world whilst receiving their education in analogue schools.

Education policy is, of course, a devolved matter and school systems across the UK differ in important ways. While examinations remain a critical focus and the main vehicle for young people's progression into tertiary education and the workplace in the nations as much as in England, there are signs of unease with the limitations of rigid, subject-based curricula. In Scotland, the Curriculum for Excellence[584] represents a significant shift in school education policy, and an attempt to move away from past focus on narrow subject domains towards a cross-curricular and inter-disciplinary approach. The Curriculum focuses on developing four capacities in learners – successful learners, confident individuals, responsible citizens and effective contributors – and places strong emphasis on cross-cutting themes such as enterprise and creativity, along with new forms of continuous assessment. It is a wholesale and bold reshaping of education policy and practice, the impacts of which will not be fully observable for a generation, and is not without challenges in its implementation.[585]

In Wales, the Welsh Baccalaureate (introduced in 2003) is more broadly drawn than its proposed English equivalent, but Wales is struggling with what appears to be a structural loss of relative achievement in numeracy and literacy, according to the PISA international assessments, and shares other weaknesses of the current system in England.[586]

Education policy in Northern Ireland has been less radical than in Scotland and is closer to that of England and Wales. All schools in Northern Ireland follow the Northern Ireland Curriculum which is based on the National Curriculum used in England and Wales. Currently there are proposals to reform the curriculum to make its emphasis more skills-based in an attempt to reform the system and address persistent issues of inequality. These reforms, however, propose little to address the concerns voiced by the Creative Industries Council Skillset Skills Group.

Higher Education

The UK's creative industries are a relatively big employer of university graduates – the proportion of graduates in their workforce being much higher than the UK average. So, 57 per cent of the creative media workforce holds a degree, compared with 37 per cent for the workforce as a whole.[587] This is particularly the case in 'high tech', digital creative sectors – around three-quarters of the workforce in sectors like video games, visual effects and interactive media have at least an undergraduate degree, and substantial numbers also have postgraduate qualifications (25 per cent in games, 33 per cent in visual effects and 36 per cent in interactive media).

Universities produce enormous numbers of graduates from courses that are described as relevant to the creative economy. In its assessment of skills supply for the creative media industries, Creative Skillset identified 18,250 'relevant' courses in UK Higher Education institutions in 2008/2009.[588] *Next Gen* argued that there was in fact a large oversupply of

graduates to the video games and visual effects industries – in 2009 alone, for example, video games specialist courses in the UK produced just under 1,600 graduates, equivalent to around 15 per cent of the whole workforce at the time. It has also been reported that there is an oversupply of talent seeking employment in sectors like music and publishing.[589]

This raises the obvious question: why, if there is a healthy – even excess – supply of graduates from courses that are seemingly relevant for the creative industries, do we see so many creative companies reporting skills shortages and difficulties filling vacancies?

Put simply, the evidence suggests that most universities haven't been producing the kind of talent that the creative industries demand. We see this in the poor employment outcomes of graduates from creative media specialist degrees evidenced in *Next Gen* (only 12 per cent of those graduating from games courses secured employment in the industry within six months of leaving university) and other studies (e.g. only 17.5 per cent of graduates from the University of Glamorgan's School of Creative and Cultural Industries gained employment in the creative sector within nine months of graduation).[590]

Next Gen also showed that video games and visual effects companies preferred to recruit from courses other than creative media (for example, from computer science, mathematics and physics courses), and even from overseas. The views of graduates currently working in these industries gathered through *Next Gen's* Talent Survey were not positive either – over a third of respondents working in the sector said that they now recognised that their course lacked industry–relevant skills.[591]

Some responsibility for this must lie with industry, which has in the main failed to specify or communicate its recruitment needs in a timely manner; perhaps partly as a consequence of creative business cultures which, as the Creative Skillset Skills Working Group pointedly notes, emphasise *"celebration and showcasing rather than systematically investing in increasing competitiveness."*[592]

But UK universities must also share some of the blame. They have been accused of being insufficiently responsive towards the needs of their students or to industry's, partly because they have lacked the incentives to do so. In the past, prospective students have not been given sufficient information about what will be taught in creative courses, about whether what is being taught will help them gain creative employment, and about the eventual performance of graduates in the creative labour market. From an economics standpoint, uninformed buyers have made for opportunistic sellers, most visibly through 'bums on seats' policies that have put numbers of students above the quality of their learning experiences (or eventually, the skills they bring to the workplace).

This view is echoed by the Creative Industries Council Skillset Skills Working Group, which believes that there are too many ill–informed students chasing too many ill–defined degree courses: *"As the costs of higher education rise, it is increasingly important that prospective students and parents are able to differentiate and make informed choices about courses and institutions."*[593] In November 2012, Creative Skillset announced a pilot scheme funded by the UK Commission of Skills & Employment to increase the numbers of accredited courses (and therefore, increase the levels of information in the creative education market). The resulting Creative Skillset 'Tick' scheme has led to the accreditation of 96 courses in areas such as publishing, computer graphics, advertising, film, media business/ entrepreneurship, and art and design, and the scheme is now being rolled out.[594]

But there are further structural barriers in the way of a better match between what universities can offer and what creative businesses need. Foremost, and as we have discussed, the vast majority of creative businesses are small, and lack the people and time to help universities design curricula that are relevant to their needs. Second, the rapid pace of change in technologies and creative markets calls for a degree of agility in education provision that most universities simply do not have. As a consequence, not

only do universities lack the information to address the needs of creative businesses, but even if they had, it is not clear if they would be able to adapt as these needs change (say, by redesigning their curricula or by acquiring – in some cases expensive – new technologies).[595] It has been estimated that approving and accrediting new university qualifications can take anything up to 2–3 years: as the Creative Skillset Skills Working Group notes, *"this may be acceptable for a degree in History, but not for a Masters in Interactive Media Design."*[596]

There are also questions about the ability of most UK universities to teach those practice-based skills related to craft knowledge, team working and entrepreneurialism that we earlier argued were so important to the creative economy. Although there are some excellent examples of 'work-based' simulation programmes in the UK such as the Dare to be Digital competition organised by the University of Abertay at Dundee (where multi-disciplinary student teams produce a games prototype which is then assessed by industry), the organisational structure of universities (arranged along disciplinary lines), and institutional inertias (also connected to the difficulties of assessing teams as compared to individuals) create barriers to the wider adoption of work-based learning models in universities.

The exceptions here may be in the arts and design schools across the UK and where key attributes of creativity – independence, problem solving and collaborative working – are inherent to studio-based learning.[597] More could be learned from these experiences, but British higher education institutions do not seem to be very good at learning from each other.

Some of these frustrations formed relevant context for the Browne Review of Higher Education Funding in England[598] and the subsequent measures announced in the 2011 Higher Education White Paper,[599] which appear to proceed from exasperation with regard to the creativity in education agenda by explicitly prioritising STEM subjects. While the importance of science, technology, engineering and mathematics to the UK's creative economy cannot be disputed, the false opposition between STEM and creativity that this reinforces is unhelpful both to the interests of the creative economy, and of the UK more generally.

The shifts in higher education policy embodied in the Browne reforms have not, thus far, been mirrored everywhere in the devolved nations. While STEM is an area of focus across the UK, Scotland has maintained a strong commitment to creative education, and has not withdrawn public funding support from the range of subjects that have been affected in England. The Scottish Government also made clear its commitment to creative education in its response to the changing fee regime in England.[600] This level of ongoing commitment to creative education is, however, less evident in Northern Ireland and Wales.

Vocational Education and Continuous Professional Development

Although Further Education colleges, and other forms of vocational education, particularly apprenticeships, could act as channels for the structured acquisition of practical skills that universities don't seem so well geared to provide, take-up by the creative industries has in the past been low – less than 1 per cent of creative media companies, for example, have ever offered a formal apprenticeship.[601]

Creative businesses' preference for university graduates over those from vocational education is in some cases explained by the high levels of skills they require. The perception that apprenticeships focus on 'lower level' skills may have been intensified by the lack, until very recently, of 'Higher Apprenticeships' providing skills at the undergraduate degree or Masters equivalent and with a creative focus. Structural features of the creative economy – including the predominance of micro businesses, their reliance

on project-based work, and the popularity of (mostly unpaid) internships (a culture which Creative and Cultural Skills and New Deal of the Mind are attempting to address through 2,000 paid internships in its Arts Council-funded Internship Academy),[602] creates further barriers to the recruitment of apprentices.

A supply of Continuous Professional Development (CPD) options is also important to keep the skills of the creative workforce fresh in the face of continued and rapid changes in technologies and markets. However, the market for CPD presents some coordination problems and externalities which are exacerbated in the case of the creative economy and that may give rise to market failure – in particular, if creative firms under-invest in training their employees because of the risk that, once trained, these employees will move on with their newly acquired skills.[603] High levels of uncertainty in creative markets, and the reliance on freelancers in some sectors, also reduce the incentives to invest heavily in employee CPD.[604]

In its report to the Creative Industries Council in January 2012, the Creative Skillset Skills Working Group put forward a portfolio of initiatives to increase the visibility and attractiveness of apprenticeships for creative SMEs, and improve the skills of the creative workforce, as well as its managers and leaders.[605]

3. Conclusions

Tomorrow's creative economy will require an even richer fusion than today's of knowledge and skills from individuals who are comfortable working across the boundaries of established disciplines. At all levels in the education system, from school curriculum design to university-business links, the lamb of the arts and humanities must lie down with the lions of digital technology and computer science.

In schools, a major implication is that rigorous GCSEs in both art and in design & technology should be included in the English Baccalaureate.

Schools should also think hard about how they can harness the potential of digital technologies across the curriculum. Nesta's *Decoding Learning* report suggests that they need to pay more careful attention to the ways in which they deploy technology in the classroom. New opportunities in this area open up everyday. The affordable Raspberry Pi computer, which has sold a million units since it was launched in February 2012, allows for low-cost experimentation.[606] Nesta's Digital Makers programme is campaigning for, and supporting, intiatives which encourage young people to engage more creatively with digital technologies in informal settings. Google's announcement of its three-year partnership with Teach First aimed at improving the quality of science and technology teaching in schools in challenging circumstances is another encouraging development (though it is taking longer than it should to roll this out across the whole of the United Kingdom).[607]

More challenging, but no less pressing, we need to revisit Sir Ken Robinson's contention in All our Futures that, as currently provided, formal education *"militates against the creative forces of curiosity, imagination, and intuition."*[608] Do we think he is wrong? Or have we become so dispirited that we cannot bear to ask the question?

The situation beyond schools is arguably more encouraging. Steps are currently being taken to improve the situation in universities as well as vocational education and training. As part of the Higher Education reforms following the Browne review, prospective university students are being provided with a 'Key Information Set' which includes the employment outcomes of previous graduates and course indicators of industry relevance such as the 'Tick' kitemark developed by Creative Skillset.[609]

The UK's universities and other educational providers should be further encouraged to offer courses which equip students with the craft and technical, but also the soft and commercial skills that the creative economy needs. This requires tackling the institutional inertias and risk aversion that keep them from following successful examples of work-based simulation (and entrepreneurship generation) like Abertay's Dare to be Digital competition. Alacrity, an innovative scheme based in Newport, South Wales, is an example of the genre – in this case at post-graduate level.[610] There is much to be said for introducing greater competition for universities in these areas, by raising the prestige of creative industries apprenticeships, for example (as Creative Skillset has started doing), and exploring a potentially expanded role for private training providers in the creative labour market.

On the vocational education and training side, the government has carried out substantial investments in industry-led initiatives to improve the skills of the creative workforce. This includes £4.7 million towards the 'Creative Catalyst' online platform that will aggregate demand for training services from creative businesses and encourage them to share information and skills with each other.[611] In addition to this, the Employer Ownership Skills Pilot (EOSP) fund to encourage the private sector to invest in the skills of its workforce has funded bids from sectors like textiles,[612] broadcasting[613] and music[614] to the tune of £13 million, and the Treasury has announced that £6 million will be made available in training for video games, high-end TV productions, film and animation to accompany the new development tax credit, subject to industry co-funding, as well as a contribution (announced in the 2013 Budget) of £10 million in match funding over the next two year to the Skills Investment Fund (SIF) to support skills development in digital content sectors.[615]

One of the EOSP pilots being funded is the BBC and Channel Four's 'Open Channels', which aims to improve production and technology skills – and increase diversity – across the broadcasting value chain. As part of this initiative, the BBC will offer over a hundred apprenticeships providing advanced technology skills.[616] There is scope for the BBC and other broadcasters with strong digital competences to help develop the capabilities and skills of creative businesses such as digital media and games, as a long-term investment in value chains they will rely on increasingly in years to come.

Massive Open Online Courses (MOOCs) provide another route to much needed competitive disruption, so long as careful attention is paid to quality and understanding the student experience. The UK's creative economy has great potential to gain from exploiting those opportunities in order to develop relevant workforce knowledge and skills. Imagine, for example, if online courses on cutting-edge digital techniques were provided by the country's leading institutions, or courses that fused technology and creative disciplines across different departments or even universities. Or that low-cost courses were available which offered innovative 'blends' of online lectures and digital practice, making use of affordable content production tools. There may be scope here for an alliance between the UK's creative industries and FutureLearn, the MOOC platform that was recently announced by the Open University in partnership with 12 other universities, to ensure that the right online courses for creative businesses are available.[617]

PROPOSAL TEN

Governments across the UK should make a Schools Digital Pledge, designed to ensure that the school curriculum, including its representation in the English Baccalaureate, brings together art, design, technology and computer science and that young people are able to enjoy greater opportunities to work creatively with technologies, both in and out of school. Steps should also be taken to address the disconnect between what UK creative businesses need from graduates and what universities are teaching them. Measures to improve the quality of graduate employment data made available to prospective applicants for creative courses (including industry-approved course kitemarks) should be extended.

A MANIFESTO FOR THE CREATIVE ECONOMY

Ten recommendations

PROPOSAL ONE

The Government should adopt our proposed new definitions of the creative industries and the wider creative economy. These are simple, robust and recognise the central role of digital technologies.

PROPOSAL TWO

Policymakers should establish a 'creative innovation system' framework within which strategic priorities can be addressed in a coherent and effective manner.

PROPOSAL THREE

The Government should make R&D tax relief more accessible to creative businesses. Technology Strategy Board programmes should be further broadened to address the needs of the creative economy. Public procurement rules should be changed to open up opportunities for smaller digital firms. Cross-disciplinary Research Council knowledge exchange initiatives should be rigorously evaluated and the lessons applied in a further round of investment. More international collaborations with leading research centres should be encouraged.

PROPOSAL FOUR

Local policymakers should observe our seven-point guide for developing creative clusters.

PROPOSAL FIVE

Government should ensure that its generic business finance schemes do not discriminate against creative businesses, and that regulations help the development of financial Internet platforms (such as crowdfunding sites). Absent hard evidence on their efficacy, government should resist introducing new sector-specific finance programmes. A higher priority is to coordinate the collection and publication of investor-friendly data through the Creative Industries Council, thus supporting the development of a thicker market for risk finance.

PROPOSAL SIX

The Treasury and the DCMS should undertake a broad-based assessment of the value of public arts and cultural spending in the UK, drawing upon similar work on the natural environment and the Cultural Value Project of the Arts and Humanities Research Council. Funding decisions should be justified in the light of criteria that emerge from this work.

PROPOSAL SEVEN

Funders should incentivise experimentation with digital technologies by arts and cultural organisations and allocate a sustained percentage of their resources to digital R&D, ensuring that the evidence arising from this work is openly shared. Under its new leadership, the BBC should publish in 2013 a strategy to reflect its Digital Public Purpose in the period to 2018, not least through the ambitious vehicle of its Digital Public Space initiative.

PROPOSAL EIGHT

Ofcom should be given powers to gather information in all Internet markets in order to maximise the chances of sound and timely judgments about the emergence of potentially abusive market power and other market concerns (an 'early warning system'). Ofcom should contribute a regularly updated strategic overview of these issues, working closely with the Information Commissioner's Office, the Intellectual Property Office, the Competition and Markets Authority and other relevant agencies. Ofcom's remit should be broadened to advise the Government on the actions needed to ensure the UK enjoys a flourishing, open Internet, balancing the interests of consumers and citizens and committed to supporting innovation and growth. These changes should be a central feature in any Communications Bill planned for 2013/14.

PROPOSAL NINE

UK copyright rules and exceptions should be re-balanced, along the lines proposed by the UK Government, and also at the European level as part of the drive for a European Digital Single Market. A new mechanism for enabling vastly increased and more efficient rights licensing transactions (through the proposed Copyright Hub) should be further developed during 2013, again with potential European replication.

PROPOSAL TEN

Governments across the UK should make a Schools Digital Pledge, designed to ensure that the school curriculum, including its representation in the English Baccalaureate, brings together art, design, technology and computer science and that young people are able to enjoy greater opportunities to work creatively with technologies, both in and out of school. Steps should also be taken to address the disconnect between what UK creative businesses need from graduates and what universities are teaching them. Measures to improve the quality of graduate employment data made available to prospective applicants for creative courses (including industry-approved course kitemarks) should be extended.

ENDNOTES

1. Cooke, P. (2010) 'The United Kingdom Automotive Industries: Status, Economic Recovery and Expectations.' A report for the SMMT. See: http://www.smmt.co.uk/wp-content/uploads/United-KIngdom-Automotive-Industries-status-economic-recovery-and-expectations.pdf (last accessed 11 April 2013).
2. Hendry, J. (1990) 'Innovating for Failure: Government Policy and the Early British Computer Industry.' MIT Press: London.
3. Murmann, J.P. (2006) 'Knowledge and Competitive Advantage: The Coevolution of Firms, Technology, and National Institutions.' Cambridge: Cambridge University Press.
4. *"Disruptive innovation is what the Internet was designed to foster."* Naughton, J.(2012) 'From Gutenberg to Zuckerberg: what you really need to know about the Internet.' London: Quercus.
5. In 2012, annual global revenues of the recorded music industry rose (by 0.3 per cent) for the first time since 1999. See: http://www.ifpi.org/content/section_resources/dmr2013.html (last accessed 11 April 2013).
6. Brynjolfsson, E. and McAfee, A. (2011) 'Race Against the Machine.' Digital Frontier Press; Arthur, W.B. (2011) The second economy. 'McKinsey Quarterly.' See: http://www.mckinseyquarterly.com/The_second_economy_2853. (last accessed 11 April 2013).
7. Berners-Lee, T. (2009) Comments at 18th International World Wide Web Conference, Madrid.
8. Startup Genome/Telefonica Digital (2012) 'Startup Ecosystem Report 2012 Part One.' See: http://cdn2.blog.digital.telefonica.com.s3.amazonaws.com/wp-content/uploads/2013/01/Startup-Eco_14012013.pdf (last accessed 11 April 2013).
9. Boston Consulting Group. (2012). 'The Connected World: The Digital Manifesto: How Companies and Countries Can Win in the Digital Economy.' Boston. BCG. https://www.bcgperspectives.com/content/articles/growth_innovation_connected_world_digital_manifesto/ (last accessed 11 April 2013).
10. http//www.go-on.co.uk/files/The_Booz_Report_Nov2012.pdf. (last accessed 11 April 2013). The £63 billion is calculated by modeling the relationship between GDP and a country's ranking on the Booz Digitization Index, and then inferring how much higher GDP would have been if the UK had in fact been in top place.
11. McKinsey (2011) 'Internet matters: The Net's sweeping impact on growth, jobs and prosperity.' McKinsey Global Institute.
12. Copenhagen Economics (2010) 'The Economic Impact of a European Digital Single Market.' Final Report. Copenhagen: Copenhagen Economics. See: http://www.epc.eu/dsm/2/Study_by_Copenhagen.pdf (last accessed 11 April 2013).
13. Ofcom (2012) 'Communications Market Report 2010.' London: Ofcom. Available from: http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr12/uk/ (last accessed 11 April 2013).
14. Cambini, C. and Jiang, Y. (2009) Broadband investment and regulation: A literature review. 'Telecommunications Policy.' 33(10), 559-574. Holt, L. and Jamison, M. (2009) Broadband and contributions to economic growth: Lessons from the US experience. 'Telecommunications Policy.' 33(10), 575-581.
15. Koutroumpis, P. (2009) The economic impact of broadband on growth: A simultaneous approach. 'Telecommunications Policy.' Volume 33, Issue 9, October 2009, pp. 471-485.
16. See: http://www.cesifo.de/pls/guestci/download/CESifo%20Working%20Papers%202009/CESifo%20Working%20Papers%20December%202009/cesifo1_wp2861.pdf (last accessed 11 April 2013).
17. Bresnahan, T. F. and Trajtenberg, M. (1995) General purpose technologies 'Engines of growth'? 'Journal of Econometrics.' 65(1), 83-108.
18. Zittrain (2008) describes the Internet's *"capacity to produce unanticipated change through unfiltered contributions from broad and varied audiences"* its 'generativity'. Zittrain, J. (2008) 'The Future of the Internet: And How to Stop it.' Newhaven CT: Yale University Press.
19. The ubiquity of the commercial Internet has led some to argue that it is a General Purpose Technology in its own right. Atkinson, R., Ezell, S., Andes, S., Castro, D. and Bennett, R. (2010) 'The Internet Economy 25 Years After.com: Transforming Commerce and Life.' Washington DC: The Information Technology and Innovation Foundation.
20. e-Skills UK (2012) 'Technology Insights 2012.' London: e-skills UK.
21. http://www.guardian.co.uk/business/2012/nov/02/apple-ipad-comet-administration-japan (last accessed 11 April 2013). (*"The Japanese electronics industry is in crisis..... Panasonic, Sharp and Sony are expected to rack up losses of $46bn this year, effectively wiping out nearly two decades' worth of profits."*)
22. Murmann J.P. (2003) 'Knowledge and Competitive Advantage: The Coevolution of Firms, Technology, and National Institutions.' Cambridge: Cambridge University Press. Kennedy, P. (1987) 'The Rise and Fall of the Great Powers.' London: Fontana. P.200.
23. Ofcom (2012) 'Communications Market Report.' London: Ofcom.
24. Ofcom (2012) 'Communications Market Report.' London: Ofcom.
25. Ofcom (2012) 'International Communications Market Report.' London: Ofcom.
26. Ofcom (2012) 'Communications Market Report.' London: Ofcom.
27. See: http://www.bpi.co.uk/media-centre/digital-revenues-overtake-physical-in-uk-recorded-music-market.aspx (last accessed 11 April 2013).
28. Schumpeter, J. (1942) 'Capitalism, Socialism and Democracy.' New York: Harper and Brothers.
29. Rose, F. (2012) 'The Art of Immersion.' New York: W. W. Norton. Jenkins, H. (2006) 'Convergence Culture.' New York: New York University Press.
30. Ofcom (2012) 'Communications Market Report.' London: Ofcom.
31. http://www.techwatch.co.uk/2012/10/01/instagram-overtakes-twitter-on-mobile/ (last accessed 11 April 2013).
32. Anderson, C. (2012) 'Makers: The New Industrial Revolution.' New York: The Crown Publishing Group.
33. Keane, M. (2013) 'Creative Industries in China: Art, Design and Media.' Polity Press: Cambridge. Bakhshi, H. and Schneider, P. (2012), 'Crossing the River by Feeling for Stones: A new approach to exporting creative content to China?' Nesta: London.
34. Higson, C., Rivers, O. and Deboo, M. (2007) 'Creative Business – Crafting the Value Narrative.' Centre for Creative Business, http://sandbox.ntradmin.com:11438/ntradmin/de-DE/focs/5047_CraftingtheNarrative.pdf (last accessed 11 April 2013).
35. Broadbent, B. (2012) 'Productivity and the allocation of resources.' Speech given at Durham Business School, 12 September 2012. See: www.bankofengland.co.uk/publications/Documents/speeches/2012/speech599.pdf (last accessed 11 April 2013).
36. HMT (2011) 'The Plan for Growth.' London: HMT. See: http://cdn.hm-treasury.gov.uk/2011budget_growth.pdf (last accessed 11 April 2013).
37. The DCMS's definition is *"those industries which have their origin in individual creativity, skill and talent and which have a*

potential for wealth and job creation through the generation and exploitation of intellectual property."

38. Higgs, P., Cunningham, S. and Bakhshi, H. (2008), 'Beyond the Creative Industries: Mapping the Creative Economy in the United Kingdom.' London: NESTA.
39. Stoneman, P. (2009) 'Soft Innovation: Towards a more complete picture of innovative change.' London: NESTA; Lash, S. and Lury, C. (2007) 'Global Culture Industry.' Cambridge: Polity Press.
40. Bakhshi, H., McVittie, E. and Simmie, J. (2008) 'Creating Innovation: Do the creative industries support innovation in the wider economy?' London: NESTA; Pine, B. J. and Gilmore, J.H. (2009) 'Using art to render authenticity in business.' See also 'Beyond experience: culture, consumer and brand.' London: Arts and Business; Potts, J. and Cunningham, S. (2010) Four models of the creative industries. 'Revue d'economie politique, Dalloz.' 120(1): 163-180.
41. Nesta (2012) 'UK Innovation Index: Measuring the Contribution of Innovation to Economic Growth, and How This Varies Across Sectors.' Nesta: London. http://www.nesta.org.uk/library/documents/Innovation_Indexv2012.pdf (last accessed 11 April 2013).
42. Christensen, C.M. (1997) 'The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail.' Boston MA: Harvard Business School Press.
43. Consistent with Christensen's thesis, incumbent firms in these industries have nonetheless introduced radical innovative technologies where these have been used to increase revenues through price discrimination amongst existing audiences, for example 3D films. Waterman, D. (2005) 'Hollywood's Road to Riches.' Cambridge MA: Harvard University Press.
44. Smith, M. D. and Telang, R. (2012) 'Assessing the Academic Literature Regarding the Impact of Media Piracy on Sales.' Pittsburgh PA: Carnegie Mellon University. See: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2132153 (last accessed 11 April 2013).; Liebowitz (2004) The Elusive Symbiosis: The Impact of Radio on the Record Industry. 'Review of Economic Research on Copyright.' 1(1): 93-118; Kannan, P.K., Pope, B.K. and Jain, S. (2009) Pricing Digital Content Product Lines: A Model and Application for the National Academies Press. 'Marketing Science.' 28(4): 620-636.
45. Hargreaves, I. (2011) 'Digital Opportunity: A Review of Intellectual Property and Growth.' Newport: IPO. See: http://www.ipo.gov.uk/ipreview-finalreport.pdf (last accessed 11 April 2013).
46. DCMS/BERR/DIUS (2008) 'Creative Britain: New Talents for the New Economy.' See: http://webarchive.nationalarchives.gov.uk/+/http:/www.culture.gov.uk/images/publications/CEPFeb2008.pdf (last accessed 11 April 2013).
47. HMT (2005) 'Cox Review of Creativity in Business.' London: HMT. See: http://webarchive.nationalarchives.gov.uk/+/http:/www.hm-treasury.gov.uk/coxreview_index.htm (last accessed 11 April 2013).
48. BIS/DCMS (2009) 'Digital Britain: Final Report.' London: BIS/DCMS. See: http://webarchive.nationalarchives.gov.uk/20100511084737/http://www.culture.gov.uk/images/publications/digitalbritain-finalreport-jun09.pdf (last accessed 11 April 2013).
49. Bakhshi, H. and Mateos-Garcia, J. (2010) 'The Innovation Game.' London: NESTA. See: http://www.nesta.org.uk/librarydocuments/The_Innovation_Game_-_FINAL.pdf (last accessed 11 April 2013).
50. Science, Technology, Engineering and Mathematics (STEM) and the former plus Arts (STEAM).
51. Though the latter is also likely a reflection of the creative industries being a DCMS responsibility and policy for 'other industries' being led by the Department for Business, Innovation and Skills. Arguably, this makes it harder to formulate and implement a holistic creative economy policy.
52. Most evidently in frequent extensions of the duration of copyright protection to, broadly, life plus 70 years.
53. Veugelers, R. (2012) New ICT sectors: Platforms for European growth? 'Bruegel Policy Contribution.' Issue 2012/14, August 2012. See: http://www.bruegel.org/download/parent/745-new-ict-sectors-platforms-for-european-growth/file/1606-new-ict-sectors-platforms-for-european-growth/ (last accessed 11 April 2013).
54. Nesta (2012) 'Plan I: The Case for Innovation-Led Growth.' London: Nesta. See: http://www.nesta.org.uk/library/documents/PlanIwebv3.pdf (last accessed 11 April 2013).
55. Bakhshi, H. and Throsby, D. (2010) 'Culture of Innovation: An economic analysis of innovation in arts and cultural organisations.' London: NESTA.
56. Chapain, C., Cooke, P., De Propris, L., MacNeill, S., and Mateos-Garcia, J. (2010) 'Creative Clusters and Innovation: Putting Creativity on the Map.' London: NESTA.
57. The word 'pioneering' demands qualification. There were, of course, roots in abundance, from a wide variety of sources, including Australia, UNESCO and the Greater London Council, prior to its abolition by Prime Minister Thatcher in 1986. A fuller discussion of the history is provided in Hesmondhalgh, D. and Pratt, A. C. (2005) Cultural industries and cultural policy. 'International Journal of Cultural Policy.' 11 (1). pp. 1-14.
58. Flew, T. (2011) 'The Creative Industries: Culture and Policy.' London: Sage Publications Ltd.
59. Cunningham, S. and Higgs, P. (2009) 'Measuring creative employment: implications for innovation policy. 'Innovation: Management, Policy and Practice.' 11, (2) 190-200.
60. Smith, C. (1998) 'Creative Britain.' London: Faber and Faber. P 1.
61. This was a train of thought with an already considerable intellectual history. Daniel Bell's 'The Coming of Post-industrial Society.' (Penguin) was published in 1973.
62. Smith (op cit). (1998) Appendix: summary map of the creative industries p 151.
63. The Department of Trade and Industry was replaced by the Department for Business, Enterprise and Regulatory Reform and the Department for Innovation, Universities and Skills in 2007. In 2009, the latter were replaced by the Department for Business, Innovation and Skills.
64. Smith, C. (1998) 'Creative Britain.' London: Faber and Faber.
65. Leadbeater, C. and Oakley, K. (1999) 'The Independents, Britain's new cultural entrepreneurs.' London: Demos is a good example of this insight and what, for a short period, appeared to enjoy bankable political sponsorship from the highest levels of the Blair Government. The authors wrote: *"These industries are growing at almost twice the rate of the economy as a whole, driven by powerful forces: cheaper and more powerful communications and computing, the spread of the Internet and growth in digital networks, which are opening up new distribution channels for small producers to serve global markets."*
66. Garnham, N. (2005) From Cultural to Creative Industries: an analysis of the implications of the creative industries approach to arts and media policy making in the United Kingdom. 'International Journal of Cultural Policy,' Vol. 11, No. 1, 2005. P 22.
67. Garnham, N. (2005). From Cultural to Creative Industries: an analysis of the implications of the creative industries approach to arts and media policy making in the United Kingdom. 'International Journal of Cultural Policy.' Vol. 11, No. 1, 2005. P 22. argues that the pact at the heart of the new creative industries was one in which the rapidly growing software industry offered levels of growth beyond anything likely to occur in the core creative industries in return for Government support for their own sector's emerging issues around the enforcement of IP rights. According to Garnham: *"It suited these interests to sell the extension of copyright as a defence of the interest of 'creators,' with all the moral prestige associated with the 'creative artist."*

68. Ironically, at the same time as the UK was failing to organise Creative Britain's policy response to the Internet, there was a growing recognition by policymakers of issues around the extent of UK's investment in ICT and its contribution to productivity growth in 'the new economy'. Bakhshi, H. and Larsen, J. (2001) 'Investment-specific Technological Progress in the United Kingdom.' Bank of England working paper 129; Oulton, N. (2001) 'ICT and productivity growth in the United Kingdom.' Bank of England working paper 140. See: http://www.bankofengland.co.uk/publications/Documents/workingpapers/wp129.pdf (last accessed 11 April 2013).
69. Scottish Enterprise (1998) 'Creativity and Enterprise.' Glasgow: Scottish Enterprise.
70. Scottish Enterprise (2000) 'Creating Success: Creative Industries Strategy for Scotland.' Glasgow: Scottish Enterprise.
71. Scottish Government (2011) 'Growth, Talent and Ambition – The Government's Strategy for the Creative Industries.' Edinburgh: The Scottish Government. See: http://www.scotland.gov.uk/Resource/Doc/346457/0115307.pdf (last accessed 11 April 2013).
72. DCAL (2001) 'Unlocking Creativity – Making it Happen,' Belfast: DCAL; DCAL and DETI (2005) 'Unlocking Creativity: A Creative Region.' Belfast: DCAL.
73. DCAL and Arts Council of Northern Ireland (2008) 'Strategic Action Plan: Creative Industries in Northern Ireland.' Belfast: DCAL. See: www.dcalni.gov.uk/strategic_action_plan_for_creative_industries.doc (last accessed 11 April 2013).
74. See: http://www.niassembly.gov.uk/Documents/Reports/Culture-Arts-and-Leisure/Creative%20Industries/Creative%20Inductry%20Vol%201.pdf (last accessed 11 April 2013).
75. Welsh Assembly Government (2004) 'Creative Success: a strategy for creative industries in Wales.' Cardiff: Welsh Assembly Government.
76. Hargreaves, I. (2010) 'The Heart of Digital Wales: a review of creative industries for the Welsh Assembly Government.' P 12.
77. British Council (2010) 'Mapping the Creative Industries: A Toolkit. Creative and Cultural Economy Series/2.' See: http://www.britishcouncil.org/mapping_the_creative_industries_a_toolkit_2-2.pdf (last accessed 11 April 2013).
78. Identified in Mulgan, G. (1994) 'Liberation Technology.' London: Demos, then the Labour Party's 1995 publication 'Communicating Britain's Future.' See Ofcom's (2006) 'Office of Communications: Case Study on public sector mergers and regulatory structures.' See: http://www.ofcom.org.uk/files/2010/07/public_sector_merger_case_study.pdf
79. Cameron,D. (2009) 'People Power – Reforming Quangos.' See: http://www.conservatives.com/News/Speeches/2009/07/David_Cameron_People_Power_-_Reforming_Quangos.aspx (last accessed 11 April 2013).
80. Lord Puttnam, See Ofcom's (2006) 'Office of Communications: Case Study on public sector mergers and regulatory structures.' See: http://www.ofcom.org.uk/files/2010/07/public_sector_merger_case_study.pdf
81. This extract from Hansard Online Forum on the 2003 Communications Bill conveys the flavour of the debate: *"On the regulation of Internet content, Safo Kordestani of the Periodical Publishers Association pointed to print self-regulation under the Committee of Advertising Practice and Press Complaints Commission as a useful model and noted that both of these bodies had made provision for online content. In reply, Richard Allan MP noted that self-regulation would still leave extensive amounts of unregulated Internet content, and would contrast starkly with broadcasting regulation as convergence developed - although David Harrington of the CMA thought this was an issue for the next Communications Bill in ten years' time. However, Claire Milne (an Internet Watch Foundation Board member) argued that the Internet was already a mass medium, and was sceptical that the industry would provide self-regulation."*
82. Ofcom (2012) 'Communications Market Report.' London: Ofcom, (2012) 'International Communications Market Report.' London. Ofcom.
83. Ofcom (2012) 'Communications Market Report.' London: Ofcom.
84. National Advisory Committee on Creative and Cultural Education (1999) 'All Our Futures: Creativity, Culture and Education.' See: http://sirkenrobinson.com/skr/pdf/allourfutures.pdf (last accessed 11 April 2013).
85. See: http://www.youtube.com/watch?v=h_2jh3MRjtI&feature=relmfu (last accessed 11 April 2013).
86. Department for Education (2010) 'The Importance of Teaching: The Schools White Paper.' London: TSO.
87. See: http://www.ncarts.org/elements/docs/NCCreativeIndustryContribution_Overview.pdf (last accessed 11 April 2013).
88. See: http://www.bostonredevelopmentauthority.org/pdf/ResearchPublications/CreateBoston.pdf (last accessed 11 April 2013).
89. The Adelphi Charter was signed by an impressive group of global thinkers on IP issues. It was hosted by the RSA. See: http://www.thersa.org/fellowship/where-you-are/usa/highlights/adelphi-charter-on-creativity,-innovation-and-intellectual-property (last accessed 11 April 2013).
90. Howkins, J. (2001) 'The Creative Economy.' London: Penguin. (P. 203.) Penguin is publishing a new edition this year.
91. Andari, R., Bakhshi,H., Hutton,W., O'Keeffe, A. and Schneider, P. (2007) 'Staying Ahead: the economic performance of the UK's creative industries.' London: The Work Foundation/NESTA. See: http://www.theworkfoundation.com/Reports/176/Staying-Ahead-The-economic-performance-of-the-UK39s-creative-industries-overview (last accessed 11 April 2013).
92. Gowers, A. (2006) 'Gowers Review of Intellectual Property.' London: TSO.
93. Department for Innovation, Universities & Skills (2008) 'Innovation Nation.' London: TSO.
94. BIS/DCMS (2009) 'Digital Britain: Final Report.' London: BIS/DCMS.
95. BIS/DCMS (2009) 'Digital Britain: Final Report.' Chapter One, Executive Summary.
96. In late 2012, it was estimated by Ofcom that this machinery of online supervision and prosecution would be in place by 2014.
97. See: http://www.ipo.gov.uk/c-strategy-digitalage.pdf (last accessed 11 April 2013).
98. Two years later, in June 2011, Lammy would support an Early Day Motion in the House of Commons explicitly backing the copyright reform programme proposed in the Hargreaves Review, published in May 2011, which built upon the original Gowers proposals. See: http://www.parliament.uk/edm/2012-13/151 (last accessed 11 April 2013).
99. Here is how Wikipedia sums up the story (based upon August 2012 submissions to the online encyclopedia): *"In August 2009 Lord Mandelson was widely reported to have ordered 'technical measures' such as Internet disconnection to be included in the draft of the Digital Economy Act 2010 after a 'big lobbying operation', even though the Digital Britain report had rejected this type of punishment. The Independent reported .... that this included a meeting with DreamWorks co-founder David Geffen at the Rothschild family villa on the Greek island of Corfu.... In August 2011 a Freedom of Information (FOI) request showed that Lord Mandelson had decided to approve the inclusion of technical measures, such as the disconnection of Internet access, at least two months before public consultation had finished."* See: http://en.wikipedia.org/wiki/Peter_Mandelson (last accessed 21 April 2013).
100. Apart from copyright infringement, the DEA also included measures to strengthen Ofcom's data-gathering powers with regard to online media and transactions; as well as measures affecting Channel 4, radio and other issues. See: http://www.legislation.gov.uk/ukpga/2010/24/contents (last accessed 11 April 2013).
101. Hargreaves, I. (2011) 'Digital Opportunity. A review of Intellectual Property and Growth.' Newport: IPO.
102. An August 2011 statement by George Osborne, Chancellor, Vince Cable, Secretary of State for Business, Innovation and Skills and Jeremy Hunt, Secretary of State for Culture Media and Sport expressed general support for the Hargreaves approach. In the following months, the Government undertook detailed pre-legislative consultation before moving to enactment in late 2012/2013.

103. DCMS, 16 May 2010, Open letter to all those who work in fixed or mobile communications, television, radio, online publishing, video games and other digital and creative content industries. See: www.culture.gov.uk/commsreview (last accessed 11 April 2013).
104. HMG response to Finch Review on Academic Publishing: http://www.bis.gov.uk/assets/biscore/science/docs/l/12-975-letter-government-response-to-finch-report-research-publications.pdf (last accessed 11 April 2013).
105. One of this manifesto's authors is a member of the Creative Industries Council.
106. For a comprehensive overview of methodologies to measure the cultural industries (including the creative industries) see Unesco (2012), 'Measuring the Economic Contribution of Cultural Industries', Unesco Institute for Statistics: Montreal.
107. Higgs, P. and Cunningham, S. (2008) Creative Industries Mapping: Where have we come from and where are we going? 'Creative Industries Journal.' 1(1).
108. Soendermann, M. (2012) 'Monitoring of Selected Economic Key Data on Culture and Creative Industries 2010.' Federal Ministry of Economics and Technology (BMWi). See: http://www.kultur-kreativ-wirtschaft.de/KuK/Redaktion/PDF/monitoring-wirtschaftliche-eckdaten-kuk-2010-eng,property=pdf,bereich=kuk,sprache=de,rwb=true.pdf (last accessed 11 April 2013).
109. Freeman, A. (2011) 'London's creative industries 2011 update.' London: GLA Economics. See: http://www.london.gov.uk/sites/default/files/cin33_0.pdf (last accessed 11 April 2013). Camors, C. and Soulard, O. (2010) Les industries creatives en Ile-de-France: un nouveau regard sur la metropole. 'IAU idF.' March 2010. See: http://www.iau-idf.fr/detail/etude/les-industries-creatives-en-ile-de-france.html (last accessed 11 April 2013). Higgs, P. (2010) 'Auckland's Creative Workforce.' Auckland: Auckland City Council, NZ. See: http://www.aucklandcreatives.com/pdfs/AucklandsCreativeWorkforce.pdf (last accessed 11 April 2013).
110. Experian (2007) 'How linked are the UK's creative industries to the wider economy?: An input-output analysis.' London: NESTA. Unfortunately, the Input-Output tables are organised on the basis of products and industries that do not correspond exactly with the DCMS definitions.
111. Higgs, P., Cunningham, S. and Bakhshi, H. (2008) 'Beyond the Creative Industries: mapping the creative economy in the UK.' London: NESTA. See: http://www.nesta.org.uk/library/documents/beyond-creative-industries-report.pdf (last accessed 11 April 2013). Interestingly, Freeman (2004, 2007 and 2010) also showed that the creative industries in London were significantly more intensive in their employment of creative labour than other parts of Great Britain. See: GLA Economics (2004) 'London's Creative Sector: 2004 Update.' London: GLA. (See: http://legacy.london.gov.uk/mayor/economic_unit/docs/creative_sector2004.pdf). Freeman, A. (2007), 'London's Creative Sector: 2007 Update.' London: GLA (See http://www.london.gov.uk/mayor/economic_unit/docs/wp_22_creative.pdf). Freeman, A. (2010), 'Working Paper 40: London's creative workforce (2010 update).' London: GLA (http://legacy.london.gov.uk/mayor/economic_unit/docs/wp40.pdf).
112. This was perhaps most apparent in the so-called concentric circles model of the creative industries, developed by Australian economist David Throsby and applied in e.g., the European context by KEA See: http://www.keanet.eu/ecoculture/studynew.pdf (last accessed 11 April 2013) where artistic creation sits at the 'core' of the creative industries – software was absent from the definition. Deroin See: http://www.culturalpolicies.net/web/files/134/en/ESSnetSummaryDEPS-2011.pdf (last accessed 2011) discusses how UNESCO and UNCTAD both include software in their definitions of the creative industries; Eurostat, in contrast, has excluded it in its focus on cultural industries. Andari et al., (2007) 'Staying Ahead' adapted Throsby's concentric circles model by arguing – not wholly convincingly – that software programming, like high art, can be viewed as generating 'creative expressive value.'
113. Higgs, P., Cunningham, S. and Bakhshi, H. (2008) 'Beyond the Creative Industries: mapping the creative economy in the UK. London: NESTA. See: http://www.nesta.org.uk/library/documents/beyond-creative-industries-report.pdf (last accessed 11 April 2013).
114. Smith, C. (1998) 'Creative Britain.' London: Faber and Faber.
115. Smith, C. (1998) 'Creative Britain.' London: Faber and Faber.
116. So, for example, lacking its own SIC code, the value of Fashion Design in the UK is estimated as 0.5 per cent of 'Clothing Manufacture' and 5.8 per cent of 'Specialised Design Activities'. Improving these weights requires detailed modeling for each industry, which has not been undertaken. There are also concerns that the value added generated by very small creative businesses and sole practitioners is under-estimated. For example, the reason given by DCMS for the absence of value added data for Crafts is that the *"majority of businesses (are) too small to be picked up in business surveys"*.
117. In June 2012, the Government's Creative Industries Council set up a Technical Working Group on Creative Industries Data and Measurement, co-chaired by one of this manifesto's authors, to explore amongst other things ways that the data might be better co-ordinated.
118. Creative Scotland (2012) 'Economic Contribution Study: An Approach to the Economic Assessment of the Arts and Creative Industries in Scotland.' Final Report, June 2012. See: http://www.creativescotland.com/sites/default/files/editor/ECS_-_Final_Report_June_2012.pdf (last accessed 11 April 2013).
119. It has also arguably fueled recent controversies around the creative industries concept itself, as witnessed most recently in Scotland. See: http://www.scotsman.com/news/arts/creative-scotland-must-change-to-benefit-arts-1-2840220 (last accessed 11 April 2013).
120. For example, no one has ever established productivity growth estimates for the UK's creative industries, a key indicator of growth potential from a Treasury perspective. Nor in the UK do we have national accounts-consistent indicators of business fixed investment or spending on training, which would better enable the performance of the creative industries to be compared with other sectors.
121. See: http://www.uis.unesco.org/culture/Pages/framework-cultural-statistics.aspx and also http://ec.europa.eu/culture/our-policy-development/eurostat-essnet-culture_en.htm (last accessed 11 April 2013).
122. Bakhshi, H., Freeman, A. and Higgs, P. (2013) 'A Dynamic Mapping of the UK's Creative Industries.' London: Nesta. See: http://www.nesta.org.uk/areas_of_work/creative_economy/assets/features/a_dynamic_mapping_of_the_uks_creative_industries (last accessed 11 April 2013).
123. Stoneman, P. (2010) 'Soft Innovation.' Cambridge: Cambridge University Press.
124. This characterisation of creativity should not be viewed as instrumental. It is perfectly consistent with creative work that is motivated on intrinsic artistic grounds, for example. But it is our contention that all creative acts involve some degree of novelty and non-prescription, whatever their motivation (and that in any case motivation does not lend itself to systematic measurement).
125. Caves, R.E. (2002) 'Creative Industries: Contracts Between Art and Commerce.' Cambridge MA: Harvard University Press.
126. See also Falk, R., Bakhshi, H., Falk, M., Geiger, W., Karr, S., Keppel, L.H., and Spitzlinger, R. (2011) 'Innovation and Competitiveness of the Creative Industries.' WIFO: Vienna, who use data from the Community Innovation Survey in a number of EU countries to show that creative businesses in sectors like Software, Architecture and Publishing are significantly more likely to cooperate on innovation with external bodies than other firms (content sectors are unfortunately not well covered in this survey).

127. De Vaan, M., Boschma, R., and Frenken, K. (2012) Clustering and firm performance in project-based industries: the case of the global video game industry, 1972–2007. 'Journal of Economic Geography.'
128. A more detailed description of the Creative Grid scoring methodology and its application to UK SOC codes is provided in Bakhshi, H., Freeman, A. and Higgs, P. (2013) 'A Dynamic Mapping of the UK's Creative Industries.' London: Nesta. See: http://www.nesta.org.uk/areas_of_work/creative_economy/assets/features/a_dynamic_mapping_of_the_uks_creative_industries (last accessed 11 April 2013).
129. Bakhshi, H., Freeman, A. and Higgs, P. (2013) 'A Dynamic Mapping of the UK's Creative Industries.' London: Nesta. See: http://www.nesta.org.uk/areas_of_work/creative_economy/assets/features/a_dynamic_mapping_of_the_uks_creative_industries (last accessed 11 April 2013).
130. In fact, Bakhshi, H., Freeman, A. and Higgs, P. (2013) 'A Dynamic Mapping of the UK's Creative Industries.' London: Nesta. show that this pattern is not a general feature of the relationship between industries and occupations. Computing the intensities of the main occupational groups within the ONS's main industrial Sections for the whole economy, they show that very few of the occupational intensities match even the average seen in the creative industries. This demonstrates the strength of the claim that the creative industries have to be treated as a coherent industrial grouping.
131. Potts, J., Cunningham, S., Hartley, J., and Ormerod, P. (2008) Social network markets: A new definition of the creative industries. 'Journal of Cultural Economics.' 32(3):167-185
132. Garnham, N. (2005) From Cultural to Creative Industries: An analysis of the implications of the 'creative industries' approach to arts and media policymaking in the United Kingdom. 'International Journal of Cultural Policy.' 11(1).
133. Potts, J., Cunningham, S., Hartley, J. and Ormerod, P. (2008) Social network markets: A new definition of the creative industries. 'Journal of Cultural Economics.' 32(3):167-185
134. For example, Facebook announced in the 2013 Games Developer Conference that, in 2012, it had made over $2 billion in payments to games. The case for inclusion of these companies in the creative industries cannot rest solely on their position in creative industries value chains, however. We would not, for example include HMV, Topman and Waterstones in the definitions simply because they play an important role in the value chain for the music, fashion and publishing industries.
135. Booz and Co. (2013), 'The Digital Future of Creative UK'. See: http://www.booz.com/global/home/what-we-think/reports-white-papers/article-display/digital-future-creative-uk (last accessed 11 April 2013).
136. Advertising Association/Deloitte (2013) notes that ... *"many of the UK's most popular websites are free at the point of use. Funded by revenue they raise through advertising, they provide valuable services to consumers, including search, news, entertainment and travel information. Such sites make a tangible contribution to the economy, supporting both online and high-street sales and contributing over £7 billion to the UK economy."* Advertising Association/Deloitte (2013) 'Advertising Pays: How advertising fuels the UK economy.' See: http://www.adassoc.org.uk/pdfs/AdvAss_Advertising_Pays_Report.pdf (last accessed 11 April 2013).
137. Cox, C. and Jenkins, J. (2005) 'Between the Seams, A Fertile Commons: An Overview of the Relationship Between Fashion and Intellectual Property.' USC Annenberg School for Communications. The Norman Lear Center Conference. See: http://learcenter.org/pdf/RTSJenkinsCox.pdf (last accessed 11 April 2013). Ramsey L.P. (2006) 'Intellectual Property Rights in Advertising.' 12 Mich. Telecomm. Tech. L. Rev. 189. See: http://www.mttlr.org/voltwelve/ramsey.pdf (last accessed 11 April 2013).
138. To identify a set of creative industries, Bakhshi, Freeman and Higgs (2013) take a threshold creative intensity of 30 per cent and treat all industries with an intensity of above this as 'creative' and those below 30 per cent as not. The resulting list of creative industries is provided in Table 7.1, page 34 of their report. They also conduct a comprehensive sensitivity analysis to demonstrate the statistical robustness of this procedure. Full details are again provided in their report.
139. This result that the majority of creative talent works outside the creative industries is also a striking implication of the DCMS's estimates (Creative Industries Economic Estimates Full Statistical Release, 8 December 2011, page 28.)
140. Bakhshi, H., Freeman, A. and Higgs, P. (2013) 'A Dynamic Mapping of the UK's Creative Industries.' London: Nesta.
141. Bakhshi, H., Freeman, A. and Higgs, P. (2013) 'A Dynamic Mapping of the UK's Creative Industries.' London: Nesta.
142. Elliott, L. and Atkinson, D. (2007) 'Fantasy Island: waking up to the incredible economic, political and social illusions of the Blair Legacy.' London: Constable & Robinson.
143. The creative industries GVA and whole economy GVA estimates used to produce the % GVA share use the same data sources as the DCMS Creative Industries Economic Estimates, namely the ONS's Annual Business Survey (ABS) for the sectoral GVA estimates and the Blue Book for whole economy GVA (the ABS only covers two-thirds of sectors in the UK economy so is not a reliable source for estimating whole economy GVA). As with the DCMS estimates, this procedure is likely to underestimate the % GVA contribution of the creative industries insofar as the business registry that the ABS sample is based on excludes self-employed people who are neither VAT-registered nor run a PAYE scheme: such self-employed are likely to be disproportionately important in the creative industries.
144. In an accounting sense such estimates would combine incomes data for creative talent outside the creative industries with an estimate of their contribution to the operating surplus of the firms they work in.
145. Again, using the sectoral GVA estimates in the ABS.
146. This estimate of the GVA contribution of embedded creative workers should be viewed as a lower bound for two reasons: first, because it ignores employment in creative occupations in sectors like financial services; second, because the calculation assumes that labour productivity of creative workers in non-creative industries is the same as labour productivity of non-creative workers in these industries. However, we know that the labour productivity of creative workers in these sectors is in fact higher than for other workers (as suggested by the positive wage differentials that exist between creative occupations and other occupations in authoritative data sources like the ONS's Annual Survey of Household Earnings).
147. Further details of the GVA estimates are available from the authors on request.
148. Bakhshi, Freeman and Higgs (2013) propose a complete methodology for determining which occupations are creative from the list of official Standard Occupational Classification codes and a statistically robust threshold creative intensity above which industries should be treated as 'creative' industries.
149. The focus on 'commercial purposes' is not intended to exclude artistic activities which generate value added for the UK but were not motivated by commercial purposes. Such activities, insofar as they are picked up in the SOC and SIC codes, will appear in the metrics. Our classification of the creative industries includes for example the four-digit SIC code 'Artistic Creation', which turns out to have the highest creative intensity at 89 per cent. See Bakhshi, Freeman and Higgs (2013) op. cit. for details.
150. BPI (2013) 'Digital Music Nation 2013.' London: BPI. See: https://www.bpi.co.uk/assets/files/BPI_Digital_Music_Nation_2013.PDF (last accessed 11 April 2013).
151. See: http://www.guardian.co.uk/media/2013/jan/04/record-labels-making-money-youtube (last accessed 11 April 2013).
152. Yair, K.(2011) 'Craft and the Digital World.' Briefing Note. London: Crafts Council.

153. MTM London (2012) 'Review of market and technology trends in the Creative Industries.' London: MTM.
154. For a more detailed discussion of these issues, see MTM London (2012) 'Review of market and technology trends in the Creative Industries.' London: MTM.
155. Zittrain, J. (2006) 'The Generative Internet.' University of Oxford Faculty of Law Legal Studies Research Paper Series.Working Paper No 28/2006 June 2006.
156. MTM London (2012) 'Review of market and technology trends in the Creative Industries.' London: MTM.
157. As early as 2008, it was estimated that there were 200,000 open source projects on the Internet, representing 4.9 billion lines of code that anyone can freely download and re-use as they see fit. See: http://www.cmswire.com/cms/web-cms/open-source-code-worth-us-387-billion-004436.php (last accessed 11 April 2013).
158. See: http://cryptome.org/Internet-spy-all.pdf (last accessed 11 April 2013).
159. See: http://www.bothsidesofthetable.com/2011/06/29/changes-in-software-venture-capital-part-2-of-3/ (last accessed 11 April 2013).
160. Bruns, A. (2008) Blogs, Wikipedia, Second Life, and Beyond: From Production to Produsage. 'Digital Formations.' Vol. 45. New York: Peter Lang.
161. One of the authors of this report is leading an AHRC/EPSRC funded project: Media, Community and the Creative Citizen. See: www.creativecitizens.com: (last accessed 11 April 2013).
162. Jenkins, H. (2006) 'Convergence Culture'. New York: New York University Press; Rose, F. (2012) 'The Art of Immersion.' New York NY: W.W. Norton & Co.
163. See: http://www.youtube.com/t/faq (last accessed 11 April 2013).
164. See: http://en.wordpress.com/stats/ (last accessed 11 April 2013).
165. Flowers, S. (2008) 'The New Inventors: How users are changing the rules of innovation.' London: NESTA. See: http://www.nesta.org.uk/library/documents/Report%2015%20-%20New%20Inventors%20v6.pdf (last accessed 11 April 2013).
166. Cheshire, T. (2013) 'Talent Tube: how Britain's new YouTube superstars built a global fanbase.' See: http://www.wired.co.uk/magazine/archive/2013/02/features/talent-tube (last accessed 11 April 2013).
167. See: http://news.netcraft.com/archives/2012/09/10/september-2012-web-server-survey.html (last accessed 11 April 2013).
168. Anderson, C. (2012) 'Makers: The New Industrial Revolution.' London: Random House Business.
169. Zittrain, J. (2006) 'The Generative Internet.' University of Oxford Faculty of Law Legal Studies Research Paper Series.Working Paper No 28/2006 June 2006.
170. Gans, J. (2012) 'Information Wants to be Shared.' Boston MA: Harvard Business Review Press.
171. An early set of insights into new forms of self-organising creativity was: Leadbeater, C. and Miller, P. (2004) 'The Pro-Am Revolution' London: Demos.
172. See: http://www.apple.com/pr/library/2012/09/12Apple-Unveils-New-iTunes.html (last accessed 11 April 2013).
173. See: http://www.etsy.com/blog/news/2013/etsy-statistics-december-2012-weather-report/ (last accessed 11 April 2013).
174. See: http://revolution.co.uk/ (last accessed 11 April 2013).
175. Anderson, C. (2004) The Long Tail. 'Wired.' October 2004. See: http://www.wired.com/wired/archive/12.10/tail.html (last accessed 11 April 2013).
176. See: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1679991 (last accessed 11 April 2013).
177. Freedman, D. (2012) 'Web 2.0 and the death of the blockbluster economy', in Curran, J., Fenton, N. and Freedman, D. (2012) 'Misunderstanding the Internet.' Oxford: Routledge.
178. See: http://stakeholders.ofcom.org.uk/binaries/consultations/tv-advertising-investigation/responses/attach1.pdf (last accessed 11 April 2013).
179. Elberse, A. and Oberholzer-Gee, F. (2008) 'Superstars and Underdogs: An Examination of the Long Tail Phenomenon in Video Sales.' See: http://www.people.hbs.edu/aelberse/papers/hbs_07-015.pdf (last accessed 11 April 2013). Tan, T. and Netessine, S. (2011) 'Is Tom Cruise Threatened? An Empirical Study of the Impact of Product Variety on Demand Concentration.' ICIS 2011 Proceedings. Paper 3. See: http://aisel.aisnet.org/icis2011/proceedings/humanbehavior/3/ (last accessed 11 April 2013).
180. See: http://www.edge-online.com/features/middle-dearth-whatever-happened-to-the-middle-tier-of-videogames/ (last accessed 11 April 2013).
181. AHRC Brighton Fuse Project.
182. See: http://www.huffingtonpost.com/2012/04/15/met-opera-live-in-hd-10-million-tickets_n_1427341.html (last accessed 11 April 2013).
183. See: http://www.gamasutra.com/view/feature/134784/the_politics_of_creative_.php?print=1 http://littlemonsters.com (last accessed 11 April 2013).
184. Cheshire, T. (2013) 'Talent Tube: how Britain's new YouTube superstars built a global fanbase.' See: http://www.wired.co.uk/magazine/archive/2013/02/features/talent-tube (last accessed 11 April 2013).
185. Anderson, C. (2009) 'Free: The Future of a Radical Price'. New York NY: Hyperion.
186. Arrow, K. (1971) 'Essays in the Theory of Risk-Bearing.' Amsterdam: North-Holland Pub. Co.
187. See: https://docs.google.com/file/d/0B-whYpjV6DzWUER1VjgySzB1OG8/edit (last accessed 11 April 2013).
188. See: http://aboutus.ft.com/2012/07/27/ft-digital-subscriptions-surpass-print-circulation-globally/ (last accessed 11 April 2013).
189. Bakhshi, H. and Mateos-Garcia, J. (2012) 'Rise of the Datavores.' London: Nesta. This report shows that a significant minority of firms in all UK sectors are making sophisticated use of their online data.
190. Brynjolfsson, E. and McAfee, A. (2011) 'Race Against the Machine.' Digital Frontier Press. Though see Cowen, T. (2011) 'The Great Stagnation.'; and Gordon, R.J. (2012) 'Is US Economic Growth Over? Faltering Innovation Confronts the Six Headwinds.' NBER Working Paper for a counterview.
191. See: http://techcrunch.com/2012/08/11/analysis-web-3-0-the-mobile-era/ (last accessed 11 April 2013).
192. See: http://www.gamasutra.com/view/news/184465/2013_The_year_of_the_microconsole.php (last accessed 11 April 2013).
193. See: http://www.nesta.org.uk/home1/assets/events/in_conversation_with_mike_lynch (last accessed 11 April 2013).
194. Jovanovic, B. and Rousseau, P.L. (2005) 'General Purpose Technologies.' In 'Handbook of Economic Growth Volume 1B.' Amsterdam: Elsevier BV.
195. The Economist (2012) The revolution to come. 'The Economist.' 13 April 2012.
196. See, for example, http://thewebindex.org/2012/10/2012-Web-Index-Key-Findings.pdf, http://www.go-on.co.uk/files/2113/5237/0908/The_Booz_Report_Nov2012.pdf, and https://publicaffairs.linx.net/news/wp-content/uploads/2012/03/bcg_4trillion_opportunity.pdf (all these reports last accessed 17 April 2013).

197. Ofcom (2012) 'International Communication Markets Report.' See: http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr12/icmr/ICMR-2012.pdf (last accessed 11 April 2013).
198. See: http://www.guardian.co.uk/technology/2013/jan/14/facebook-loses-uk-users-december (last accessed 11 April 2013).
199. See: http://www.bfi.org.uk/education-research/film-industry-statistics-research/statistical-yearbook (last accessed 11 April 2013).
200. See: https://www.npd.com/wps/portal/npd/us/industry-expertise/video-games/ (last accessed 11 April 2013).
201. See: http://www.culture.gov.uk/images/consultation_responses/CR2011-PACT_Annex1.pdf (last accessed 11 April 2013).
202. See: http://www.credos.org.uk/write/Images/The%20contribution%20of%20advertising%20to%20the%20UK%20economy%20311011.pdf (last accessed 11 April 2013).
203. www.credos.org.uk/write/Images/The%20contribution%20of%20advertising%20to%20the%20UK%20economy%20311011.pdf (last accessed 11 April 2013).
204. Ferreira, F. and Waldfogel, J. (2010) 'Pop Internationalism: Has A Half Century of World Music Trade Displaced Local Culture?' NBER Working Paper No. 15964.
205. See: http://www.bbc.co.uk/mediacentre/worldwide/160712digital.html (last accessed 11 April 2013).
206. See: http://annualreport.channel4.com/assets/downloads/hi-res/c4_annual_report_2011_financials.pdf (last accessed 11 April 2013).
207. Cheshire, T. (2013) 'Talent Tube: how Britain's new YouTube superstars built a global fanbase.' Available at: http://www.wired.co.uk/magazine/archive/2013/02/features/talent-tube (last accessed 11 April 2013).
208. Centre for London (2012) 'A Tale of Tech City.' London: Centre for London.
209. Now Penguin Random House, following a joint venture between Pearson and Bertelsmann in October 2012.
210. The FT reports that Daily Mail and General Trust's (DMGT) online advertising income rose 51 per cent year on year, with 127 million unique browsers to Mail Online in January 2013. DMGT's online ad revenues soar. 'Financial Times.' 6 February 2013.
211. http://www.tiga.org/news/press-releases/the-uk-games-industry-young-independent-and-mobile (last accessed 11 April 2013).
212. See: http://www.gamesindustry.biz/articles/2013-03-29-torsten-reil-we-can-create-a-world-leading-games-economy-in-the-uk (last accessed 11 April 2013).
213. UNCTAD produces detailed bilateral trade data on a consistent basis for creative goods, but comprehensive data are not available for services. Furthermore, the creative 'goods' definitions include products as wide-ranging as toys and TV sets which makes their use limited for analysing the UK's creative industries in practice. UNCTAD (2010) 'Creative Economy Report.' Geneva: UNCTAD.
214. See: http://www.bfi.org.uk/education-research/film-industry-statistics-research/statistical-yearbook (last accessed 11 April 2013).
215. The music industry market – Generator.org.uk (2012).
216. See: http://www.gunnreport.com/products/ (last accessed 11 April 2013).
217. Crossley, R. (2010) 'Braben fears UK's drop to sixth in dev league.' See: http://www.develop-online.net/news/33703/Braben-fears-UKs-drop-to-sixth?m=posted (last accessed 11 April 2013). See also interview with documentary film-makers Anthony and Nicola Caulfield, http://metro.co.uk/2013/03/07/from-bedrooms-to-billions-uk-gaming-the-movie-3530510/ (last accessed 11 April 2013). *"There was a period where our games were flooding America and... not so much Japan but certainly all the way across Europe. Our developers were being looked upon as the guvnors and then effectively within six years that was gone."*
218. Develop 100. See: http://www.develop-online.net/develop-100 (last accessed 11 April 2013).
219. See: http://www.nesta.org.uk/library/documents/WhatsApp.pdf (last accessed 11 April 2013).
220. Film Policy Review Panel (2012) 'A Future for British Film: It Begins with the Audience.' London: DCMS. P.47.
221. For example, ONS's source notes on the official Business Enterprise Research & Development survey state that *"there may be under-coverage of businesses with fewer personnel [than 50] – and particularly of the smallest businesses with fewer than nine employees."* ONS Information note 'Coverage of the Business Enterprise Research & Development Survey (http://www.ons.gov.uk/ons/guide-method/method-quality/specific/business-and-energy/research---development-surveys/information-note--coverage-of-the-business-enterprise-r-d-survey.pdf, last accessed 17 April 2013). 'BIS's Community Innovation Survey, which surveys firms on their R&D spend and other innovation investments, excludes firms with less than ten employees by design.
222. Koss, V., Azad, S. and Gurm, A. (2012) '"This is for Everyone." The Case for Universal Digitisation.' Booz & Co.
223. Edquist, C. (2001) 'The Systems of Innovation Approach and Innovation Policy: An account of the state of the art.' Lead paper presented at the DRUID conference, Aalborg, June 12-15, 2001. See: http://folk.uio.no/ivai/ESST/Outline%20V05/edquist02.pdf (last accessed 11 April 2013).
224. Freeman, C. (1988) 'Japan: A New National System of Innovation.' In Dosi, G., et. al., (Eds.) (1988) 'Technical Change and Economic Theory.' Pinter: London; Hamalainen, T.J. (2003) 'National Competitiveness and Economic Growth: the changing determinants of economic performance in the world economy.' Cheltenham: Edward Elgar; Mazzucato, M. (2012) 'The Entrepreneurial State.' London: Demos.
225. Martin, B. and Johnston, R. (1998) Technology foresight for wiring up the national innovation system: experiences in Britain, Australia and New Zealand. 'Technological Forecasting & Social Change.' 60(1) January 1999, 37-54. See also Bakhshi, H., Freeman, A. and Potts, J. (2011) 'State of Uncertainty: Innovation policy through experimentation.' London: NESTA.
226. Gustafsson, R. and Autio, E. (2011) A failure trichotomy in knowledge exploration and exploitation. 'Research Policy.' 2011, Vol. 40, issue 6, pages 819-831.
227. Christensen, C.M. (1997) 'The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail.' Boston MA: Harvard Business School Press.
228. Malerba, F. (2002) Sectoral systems of innovation and production. 'Research Policy.' 31: 247-264.
229. Ibid.
230. Malerba, F. (2004) 'Sectoral Systems of Innovation: Concepts, Issues and Analyses of Six Major Sectors in Europe.' Cambridge: Cambridge University Press.
231. Stuart Cunningham highlights the importance of innovation activities in the creative economy as part of the wider national innovation system, as well as their neglect in conventional (STEM-centric) discourses of innovation: Cunningham, S. (2013) 'Hidden Innovation: Policy, Innovation and the Creative Sector.' Queensland: Queensland University Press. We pick up on this issue in Chapter 6. Our emphasis here is somewhat different from this: we are looking at the inputs and institutions that generate innovation in the creative economy, rather than the connectivity between the creative economy and other parts of the economy which it feeds with innovation inputs, exemplars and talent.

232. Where relevant, we draw on the existing literature on other sectoral systems of innovation that are connected, or nested within, our definition of the creative economy.
233. Montalvo, C. and van der Giessen, A. (2012) 'Synthesis report – Sectoral Innovation Watch 2008-2011.' Europe Innova.
234. Steinmueller, E. (2004) 'The European software sectoral system of innovation.' In Malerba, F. (2004) 'Sectoral systems of innovation: concepts, issues and analyses of six major sectors in Europe.' Cambridge: Cambridge University Press. pp. 193-242.
235. Bakhshi, H., Schneider, P. and Walker, C. (2008) 'Arts and humanities research and innovation.' NESTA and AHRC. See: http://www.nesta.org.uk/publications/reports/assets/features/arts_and_humanities_research_and_innovation (last accessed 11 April 2013).
236. Cooke, P. (2001) 'Regional Innovation Systems, Clusters and the Knowledge Economy.' Industrial and Corporate Change. 10(4): 945-974.
237. Bakhshi, H., Lee, N. and Mateos-Garcia, J. (2013) 'Capital of Culture.' Brookings/Nesta, forthcoming.
238. Saxenian, A. (1994) 'Regional Advantage.' Boston, MA: MIT Press; Avnimelech, G. and Teubal, M. (2007) 'The Emergence of Israel's Venture Capital Industry: How Policy Can Influence High-Tech Cluster Dynamics.' In: Braunerhjelm, P. and Feldman, M. (Eds.) (2007) 'Cluster Genesis.' Oxford: Oxford University Press.
239. Dempster, A.M. (2006) Managing Uncertainty in Creative Industries: Lessons from Jerry Springer the Opera. 'Creativity and Innovation Management.' 15(3): 224-233.
240. Dodgson, M. and Gann, D. (2010) 'Innovation: A Very Short Introduction.' Oxford: Oxford University Press.
241. BIS/NESTA (2011) 'Annual Innovation Report.' London: BIS/NESTA.
242. See: http://news.cnet.com/8301-1023_3-57498531-93/facebook-processes-more-than-500-tb-of-data-daily/ (last accessed 11 April 2013).
243. See: http://newcdn.flamehaus.com/Valve_Handbook_LowRes.pdf (last accessed 11 April 2013).
244. Stoneman, P. (2009) 'Soft Innovation.' London: NESTA.
245. OECD (2002) 'Frascati Manual.' Paris: OECD.
246. Price, D. (2009) 'The Pixar Touch'. Knopf Doubleday Publishing Group.
247. Kline, S. J. (1985) Innovation is not a linear process. 'Research management.' 28.4: 36-45. Rothwell, R. (1992) Successful industrial innovation: critical factors for the 1990s. 'R&D Management.' Volume 22, Issue 3, pages 221–240.
248. Miles, I. and Green, L. (2008) 'Hidden Innovation in the Creative Industries.' London: NESTA; Cunningham, S. (2013) 'Hidden Innovation: Policy, Industry and the Creative Sector.' Queensland: Queensland University of Technology Press.
249. Flowers, S. (2008) 'The New Inventors: How users are changing the rules of innovation.' London: NESTA.
250. R&D happens iteratively (rather than sequentially) in more industries than officials and policymakers care to admit: Rothwell, R. (1992) Successful industrial innovation: critical factors for the 1990s. 'R&D Management.' 22(3), pp. 221-240. This is particularly the case in software and design-based creative businesses (Brooks, F. (1995) 'The Mythical Man Month (20th Anniversary Edition).' New York: Addison-Wesley.
251. Cunningham, S. (2013) 'Hidden Innovation: Policy, Innovation and the Creative Sector.' Queensland: Queensland University Press.
252. See: http://cdn.hm-treasury.gov.uk/sr2010_chapter2.pdf (last accessed 11 April 2013).
253. See: http://www.bis.gov.uk/assets/BISCore/science/docs/A/10-1356-allocation-of-science-and-research-funding-2011-2015.pdf (last accessed 11 April 2013).
254. Bakhshi, H., Desai, R. and Freeman, A. (2009) 'Not Rocket Science.' Mission, Models, Money.
255. We should also update the language we use to describe the budget for public investment in research, and describe this as the 'Research' not 'Science and Research' settlement.
256. See: http://www.hmrc.gov.uk/ct/forms-rates/claims/randd.htm Hall, B. and Van Reenen, J. (2000) How effective are fiscal incentives for R&D? A review of the evidence. 'Research Policy.' 29(4), 449-469.
257. Lentile, D. and Mairesse, J. (2009) 'A policy to boost R&D: Does the R&D tax credit work?' In EIB (2009) 'R&D and the financing of innovation in Europe: Stimulating R&D, innovation and growth.' EIB Papers. 14:1.
258. Gustafsson, R. and Autio, E. (2011) A failure trichotomy in knowledge exploration and exploitation. 'Research Policy.' 2011, Vol. 40, issue 6, pages 819-831.
259. Bakhshi, H., and Mateos-Garcia, J., 2010, 'The Innovation Game.' London:NESTA.
260. A NESTA talent survey conducted in 2010 showed that almost three-quarters are graduates, and, of these, 29 per cent of have First-Class Honours degrees. Forty-eight per cent of graduates have studied STEM subjects.
261. According to a 2010 study by TIGA (one of the industries' trade bodies), 38 per cent of companies invest in R&D. TIGA (2010) 'State of the UK Video Game Development Sector 2010.' London: TIGA.
262. Chatfield, T. (2010) 'Fun Inc.' London: Virgin Books. MacGonigal, J. (2011) 'Reality is Broken.' London: Vintage.
263. An example of where the tax authorities have made efforts to meet the particular needs of pharmaceuticals companies in its testing activities is that payments made to volunteers to participate in controlled trials are treated as qualifying expenditures for the purpose of tax relief. See: http://www.hmrc.gov.uk/ct/forms-rates/claims/randd.htm#1 (last accessed 11 April 2013). In fact, the BIS guidelines contain an explicit discussion of how the tax authorities view R&D in pharmaceuticals for the purposes of assessing claims. We would propose that they do the same for creative industries. http://www.hmrc.gov.uk/manuals/cirdmanual/cird81920.htm (last accessed 11 April 2013).
264. Bakhshi, H. and Mateos-Garcia, J. (2012) 'Rise of the Datavores: How UK businesses analyse and use online data.' London: Nesta.
265. HMT (2011) 'The Plan for Growth.' London: HMT.
266. See: http://www.hm-treasury.gov.uk/d/consult_r_d_tax_credits.pdf (last accessed 11 April 2013).
267. See: http://ec.europa.eu/research/horizon2020/pdf/contributions/post/united_kingdom/technology_strategy_board.pdf (last accessed 11 April 2013).
268. See: https://connect.innovateuk.org/web/creativektn (last accessed 11 April 2013).
269. See: https://connect.innovateuk.org/web/ictomorrow (last accessed 11 April 2013).
270. See: https://catapult.innovateuk.org/connected-digital-economy (last accessed 11 April 2013).
271. See: https://www.gov.uk/government/news/budget-2013-boost-for-creative-industries-sector (last accessed 11 April 2013).
272. In comments made by Jeremy Silver, lead technologist for the creative industries in the TSB, at the launch of the CREATe RCUK Centre for Copyright and New Business Models in the Creative Economy, 31 January-1 February 2013, Glasgow.
273. Nesta (2012) 'Plan I.' London: Nesta. See: http://www.nesta.org.uk/library/documents/PlanIwebv3.pdf (last accessed 11 April 2013).

274. Bound, K. and Puttick, R. (2010) 'Buying Power: Is the Small Business Research Initiative for Procuring R&D driving innovation in the UK?' London: NESTA. The Government announced a significant scaling up of the SBRI in the 2013 budget.
275. See: http://www.designcouncil.org.uk/our-work/challenges/Health/ (last accessed 11 April 2013).
276. Science and Technology Committee (2011) 'Public Procurement as a Tool to Stimulate Innovation.'
277. Cabinet Office (2012) 'Government Digital Strategy November 2012.' London: Cabinet Office.
278. See: http://gps.cabinetoffice.gov.uk/sites/default/files/images/NV%20_%20Supplier%20Day%20slides%202013-01-11%20-%20FINAL%20with%20video%20link.pdf
279. See: http://data.gov.uk/sites/default/files/Open_data_White_Paper.pdf (last accessed 11 April 2013).
280. See: http://ec.europa.eu/internal_market/publicprocurement/modernising_rules/reform_proposals_en.htm
281. See: http://ec.europa.eu/europe2020/index_en.htm (last accessed 11 April 2013).
282. Bakhshi, H., Edwards, J., Roper, S., Scully, J. and Shaw, D. (2011) 'Creating Innovation in SMEs: Evaluating the short-term effects of the Creative Credits pilot.' London: NESTA.
283. See: http://webarchive.nationalarchives.gov.uk/+/http:/www.hm-treasury.gov.uk/coxreview_index.htm (last accessed 11 April 2013).
284. Nesta (2012) 'UK Innovation Index: Measuring the Contribution of Innovation to Economic Growth, and How This Varies Across Sectors.' London: Nesta; Corrado, C., Haskel, J., Jona-Lasinio, C. and Iommi, M. (2012) 'Intangible Capital and Growth in Advanced Economies: Measurement Methods and Comparative Results.' See: http://www.intan-invest.net/ (last accessed 11 April 2013). Hulten, C.R. and Hao, J.X. (2012) 'The Role of Intangible Capital in the Transformation and Growth of the Chinese Economy.' NBER Working Paper w18405.
285. Price, D. A. (2009) 'The Pixar Touch.' London: Vintage.
286. See: http://news.bbc.co.uk/1/hi/technology/2888431.stm (last accessed 11 April 2013).
287. AHRC (2009) 'Leading the world: the economic impact of UK arts and humanities research.' AHRC Impact Taskforce. One of the authors of this report was a member of this taskforce. See: http://www.ahrc.ac.uk/News-and-Events/Publications/Documents/Leading-the-World.pdf (last accessed 11 April 2013).
288. See: http://thechineseroom.co.uk/history.html (last accessed 11 April 2013).
289. See: http://www.hefce.ac.uk/pubs/year/2008/200802/ (last accessed 11 April 2013).
290. Crossick, G. (2006). 'Knowledge transfer without widgets: the challenge of the creative economy.' London: Goldsmiths, University of London.
291. Bakhshi, H., Schneider, P. and Walker, C. (2008) 'Arts and humanities research and innovation.' NESTA/AHRC report.
292. See: http://www.globaluncertainties.org.uk/ Other programmes funded by more than one research funding council include Lifelong Health and Wellbeing and Living with Environmental Change.
293. See: http://www.ahrc.ac.uk/What-We-Do/Extend-engagement/Knowledge-Exchange-and-Partnerships/Pages/KE-Hubs-for-the-Creative-Economy.aspx (last accessed 11 April 2013).
294. See: http://www.universitiesuk.ac.uk/Publications/Pages/CreatingProsperitytheroleofhighereducation.aspx (last accessed 11 April 2013).
295. See: http://www.universitiesuk.ac.uk/Publications/Pages/CreatingProsperitytheroleofhighereducation.aspx (last accessed 11 April 2013).
296. Hughes, A. and Kitson, M. et al. (2011) Hidden Connections: Knowledge exchange between the arts and humanities and the private, public and third sectors. AHRC. Cambridge. These numbers are broadly similar to other disciplines, although interactions with community organisations are much higher than for non-arts and humanities academics. See: http://www.ahrc.ac.uk/News-and-Events/Publications/Documents/Hidden-Connections.pdf (last accessed 11 April 2013).
297. Crossick, G. (2006) 'Knowledge transfer without widgets: the challenge of the creative economy.' A lecture to the Royal Society of Arts in Leeds, 31 May 2006. See: http://www.goldsmiths.ac.uk/warden/creative-economy.pdf (last accessed 11 April 2013).
298. See: http://www.pmstudio.co.uk/about-pervasive-media-studio (last accessed 11 April 2013).
299. RCUK (2012) 'Digital Economy: Report of the 2012 RCUK Digital Economy Impact Review Panel.' (One of this manifesto's authors is a member of the advisory panel of the EPSRC-led Digital Economy research panel.)
300. Lenoir, T. (2004) 'Myths about Stanford's interactions with Industry.' See: http://iis-db.stanford.edu/evnts/4097/TLenoir_Myths_about_Stanford.pdf
301. Ku, K. (2002) 'Software Licensing in the University Environment.'; Interview conducted as part of an evaluation of the Edinburgh–Stanford Link Programme for Scottish Enterprise (EKOS, 2004).
302. Breschi, S. and Lissoni, F. (2003) 'Mobility and social networks: Localised knowledge spillovers revisited.' Milan: University Bocconi, CESPRI Working Paper 142 (2003). Klepper, S. (2009) Spinoffs: A review and synthesis. 'European Management Review.' 6.3 (2009): 159-171.
303. Clusters are the tip of the iceberg of a set of concepts that have been used to explore the geographic dimensions of economic growth and innovation. Others include 'Marshallian districts', regional innovation systems and learning regions. These different concepts emphasise different dimensions of the clustering phenomenon. For example, Alfred Marshall stressed *"industrial atmospheres"* where "knowledge and information are in the air" Belussi, F., and Caldari, C. (2009) At the origin of the industrial district: Alfred Marshall and the Cambridge school. 'Cambridge Journal of Economics.' 33(2): 335-355. By contrast, urban theorist Jane Jacobs stressed diversity between co-located firms, and the resulting cross-pollination of ideas, as giving rise to radical innovations (Jacobs, J. (1969) 'The Economy of Cities.' New York: Random House.) Michael Porter has stressed the wider local infrastructures that explain why agglomeration economies are stronger in some areas than others. (Porter, M.E. (1990) 'The Competitive Advantage of Nations.' New York: The Free Press.) Nor need these infrastructures be formal. Anna-Lee Saxenian, in her famous study of the Silicon Valley technology cluster, stressed the importance of Silicon Valley's culture of sharing information and informal relationships between firms that enabled it. Saxenian, A. (1994) 'Regional Advantage.' Boston, MA: MIT Press
304. Hartley, J., Potts, J., MacDonald, T. with Erkunt, C. and Kufleitner, C. (2012) Creative City Index. 'Cultural Science.' Volume 5(1).
305. Chapain, C., De Propris, L., Cooke, P., MacNeill, S. and Mateos-Garcia, J. (2010) 'Creative Clusters and Innovation.' London: NESTA. This research also identified a propensity for some creative sectors – in particular software, and advertising – to co-locate with companies in high-tech and knowledge intensive business services (KIBS), a finding that is consistent with the idea of creative spillovers. So, for example, it turns out that advertising, software and video games businesses strongly co-locate with knowledge-intensive business services like law, accounting and management consultancy, and that advertising and software businesses co-locate with high-tech firms. Case studies suggest that this relationship is causal: knowledge flows more easily between creative businesses and these other sectors if there are well-developed networks which connect them.
306. Florida, R. (2002) 'The rise of the creative class: and how it's transforming work, leisure, community and everyday life.' New York NY: Basic Books.

307. Florida's empirical implementation of his idea remains the subject of huge academic controversy – see, for example, http://www.nesta.org.uk/blogs/geoffs_blog/is_there_a_creative_class/ (last accessed 11 April 2013).
308. Currid, E. (2007) 'The Warhol economy: how fashion, art, and music drive New York City.' Princeton NJ: Princeton University Press.
309. Pratt, A. C. and Gornostaeva, G. (2009) The governance of innovation in the film and television industry. 'Creativity and Innovation in the Cultural Economy.' 46 (2009): 119.
310. See: http://www.publications.parliament.uk/pa/cm201213/cmselect/cmcumeds/writev/suppcrec/sce34.htm (last accessed 11 April 2013).
311. Garcia, B. (2005) Deconstructing the city of culture: The long-term cultural legacies of Glasgow 1990. 'Urban studies.' 42.5-6, pp:841-868.
312. Bakhshi, H., Lee, N. and Mateos-Garcia, J. (2013) 'Capital of Culture.' Brookings/Nesta, forthcoming.
313. See, for example Martin, R. and Sunley, P. (2003) Deconstructing clusters: chaotic concept or policy panacea? 'Journal of Economic Geography.' (2003) 3 (1): 5-35; Markusen, A. (2006) Urban development and the politics of a creative class: evidence from a study of artists. 'Environment and Planning.' A 38(10) 1921 – 1940. See: http://www.centreforcities.co.uk/assets/files/pdfs/the_wrong_stuff_discussion_paper_1.pdf (last accessed 11 April 2013).
314. Centre for London (2012) 'A Tale of Tech City.' London: Centre for London.
315. Manchester Independent Economic Review (2009) 'Innovation, Trade and Connectivity.' Manchester: MIER.
316. See: http://www.liv.ac.uk/impacts08/Papers/Creating_an_Impact_-_web.pdf (last accessed 11 April 2013).
317. Chapain, C., Cooke, P., De Propris, L., MacNeill, S. and Mateos-Garcia, J. (2010) 'Creative clusters and innovation. Putting creativity on the map.' London: NESTA.
318. See: http://www.universitiesuk.ac.uk/Publications/Pages/CreatingProsperitytheroleofhighereducation.aspx (last accessed 11 April 2013).
319. At one point, each one of the nine Regional Development Agencies in England had identified creative and digital sectors as a growth sector, and tried to spur their development regardless of whether the local conditions were right or not. Tödtling, F. and Trippl, M. (2005) One size fits all?: Towards a differentiated regional innovation policy approach. 'Research Policy.' 34 (8), pp. 1203-1219.
320. These policies have by no means been specific to the UK. See, for example, a critical evaluation of China's cluster development strategies in Beijing in Chapter 5 of Cunningham, S. (2013) 'Hidden Innovation: Policy, Innovation and the Creative Sector.' Queensland: Queensland University Press.
321. It will be important to collect the firm-level data from claimants to establish whether or not the reforms are having the desired impacts of incentivising R&D spending that would not otherwise take place. Lentile, D. and Mairesse, J. (2009) 'A policy to boost R&D: Does the R&D tax credit work?', in EIB (2009) 'R&D and the financing of innovation in Europe: Stimulating R&D, innovation and growth'. EIB Papers. 14:1.
322. Mapping of International Design Policies and Strategies for Leading Design Schools and Research Institutions, Quartz and Co, April 2011. See: http://www.erhvervsstyrelsen.dk/file/163743/mapping_international_design_policies_strategies.pdf (last accessed 11 April 2013).
323. *"The AHRC will further increase the impact of arts and humanities research on the outstanding strength of the UK's creative economy to stimulate economic and public benefit"*: The Human World: Arts and Humanities in our Times. AHRC Strategy 2013-2018 (viewed in draft, due for publication late 2012).
324. See: www.react-hub.org.uk (last accessed 11 April 2013).
325. One of this report's authors was a member of the Interim Advisory Board for the CDEC.
326. See: http://www.northernperiphery.eu/files/archive/Downloads/Events_Library/Partenariats/2010_Phoenix/N%20Ireland%20Perspective%20-%20Stephen%20McGowan.pdf (last accessed 11 April 2013).
327. De Propris, L., Chapain, C., Cooke, P., MacNeill, S. and Mateos-Garcia, J. (2009) 'The Geography of Creativity.' London: NESTA.
328. See:http://www.camclustermap.com/ (last accessed 11 April 2013).
329. See: http://www.techcitymap.com/index.html (last accessed 11 April 2013).
330. See: http://brightonfuse.com/ (last accessed 11 April 2013).
331. One of the authors of this report is part of the Brighton Fuse research team.
332. See: www.creativeclyde.com (last accessed 11 April 2013).
333. This echoes the difference between the conditions for accessing finance in 'demand-led' versus 'non-demand-led' creative sectors described in the submission to the 'Support for the Creative Economy' inquiry by creative media investment firm Ingenious Media. See: http://www.publications.parliament.uk/pa/cm201213/cmselect/cmcumeds/writev/suppcrec/sce03.htm (last accessed 11 April 2013).
334. Caves., R., Storper, M. and Christopherson, S. (1987) Flexible Specialization and Regional Industrial Agglomerations: The Case of the U.S. Motion Picture Industry. 'Annals of the Association of American Geographers.' 7(1): 101-114.
335. BIS (2011) 'Appendix 2: Access to Finance for Creative Industry Businesses: Qualitative Survey.' Report prepared for BIS and DCMS. See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32217/11-900-access-to-finance-for-creative-industry-businesses-appendix-2.pdf (last accessed 11 April 2013).
336. See: De Vany, A. S. and Walls, W. D. (2004) Motion picture profit, the stable Paretian hypothesis, and the curse of the superstar. 'Journal of Economic Dynamics and Control.' 28(6), 1035-1057. for evidence that creative projects are associated with highly variable rates of return.
337. Ellis, I. and Jarboe, K.P. (2010) Intangible assets in capital markets. 'Intellectual Asset Management.' May/June. See: http://www.athenaalliance.org/pdf/IAM_41_IntangibleAssets.pdf (last accessed 11 April 2013) describes how specialised investors are emerging which have invented new vehicles for investing in companies with significant value in intangible assets. In the UK's creative economy, probably the best known example of these is Ingenious Media.
338. Fathom Financial Consulting (2007) 'Understanding the rationale for publicly backed investment funds in the creative content industries.' London: NESTA.
339. See: http://www.parliament.uk/business/committees/committees-a-z/commons-select/culture-media-and-sport-committee/news/130122-creative-industries-ev6/ http://www.develop-online.net/news/43383/UK-devs-struggle-to-retain-original-IP-says-Livingstone (last accessed 11 April 2013).
340. See Chapter 5 in Andari, R., Bakhshi, H., Hutton, W., O'Keeffe, A. and Schneider, P. (2007) 'Staying Ahead: the economic performance of the UK's creative industries.' London: The Work Foundation/NESTA. See: http://www.theworkfoundation.com/Reports/176/Staying-Ahead-The-economic-performance-of-the-UK39s-creative-industries-overview (last accessed 11 April 2013).
341. See the case study about Television in Cardiff for an example of how the BBC did this in that creative cluster. Chapain, C., de Propris, L., Cooke, P., MacNeill, S. and Mateos-Garcia, J. (2010) 'Creative Clusters and Innovation.' London: NESTA.

342. Klepper, S. (2010) The origin and growth of industry clusters: The making of Silicon Valley and Detroit. 'Journal of Urban Economics.' 67.1 (2010): 15-32.
343. See, for example, the 2006 report of the Access to Finance and Business Support Group of the DCMS's Creative Economy Programme. See: http://webarchive.nationalarchives.gov.uk/20090204002310/cep.culture.gov.uk/index.cfm?fuseaction=main.viewsection&intsectionid=339 (last accessed 11 April 2013).
344. See: http://www.gamesindustry.biz/articles/2012-11-28-a-dearth-of-digital-disclosure
345. In a survey of small UK creative businesses (with fewer than 50 employees), only 35 per cent of businesses had established specific financial goals for the future, and of these less than two-thirds had included their goals in a formal business plan or strategy (NESTA (2006) 'Creating Growth.' London: NESTA.)
346. In a poll of 100 creative business leaders conducted by Nesta in August 2012, only one in five described their businesses as excelling in "financial planning and forecasting" and "business planning". See: http://www.nesta.org.uk/press_releases/assets/features/ambitious_creatives_lack_business_and_financial_focus (last accessed 11 April 2013).
347. Clayton, L. and Mason, H. (2006) 'The Financing of UK Creative Industries SMEs.' London: BOP.
348. Fraser, S. (2011) 'Access to Finance for Creative Industry Businesses.' London: BIS/DCMS. See also BIS (2011) 'Access to Finance for Creative Industries Businesses, Appendix II: Qualitative Survey.' London: BIS. (last accessed 11 April 2013).
349. See: http://www.nesta.org.uk/library/documents/unlocking-potential-innovative-firms-pb.pdf (last accessed 11 April 2013).
350. Haldane, A. (2011) 'The Short Long.' Speech to the 29th Société Universitaire Européene de Recherches Financières Colloquium: New Paradigms in Money and finance? Brussels. See: at: http://www.bankofengland.co.uk/publications/documents/speeches/2011/speech495.pdf (last accessed 11 April 2013). BIS (2012) 'The Kay Review of UK Equity Markets and Long-Term Decision Making Interim Report.' London: BIS. See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/31685/12-631-kay-review-of-equity-markets-interim-report.pdf (last accessed 11 April 2013).
351. Research suggests there are also wider benefits to UK firms from inwards foreign direct investment (Nesta (2012) 'Foreign Direct Innovation? London: Nesta). Think of the boost in the industrial capacity of the UK automobile industry brought about by Japanese inward investment, for example. Studies have also shown that the effective IT practices of US multinationals more generally rub off on the UK companies they acquire. Bloom, N., Sadun, R., and Van Reenen, J. (2012) Americans Do IT Better: US Multinationals and the Productivity Miracle. 'American Economic Review.' 2012, 102(1): 167–201. Branstetter, L. (2006) Is foreign direct investment a channel of knowledge spillovers? Evidence from Japan's FDI in the United States. 'Journal of International Economics.' 68(2), 325-344. Javorcik, B. S. (2004) Does foreign direct investment increase the productivity of domestic firms? In search of spillovers through backward linkages. 'American Economic Review.' 94(3), 605-627.
352. See: http://www.guardian.co.uk/technology/pda/2010/sep/10/slow-death-of-dopplr (last accessed 11 April 2013).
353. Ian Livingstone's evidence given on 13 October 2010 to House of Commons Scottish Affairs Committee, 'Video games industry in Scotland, Second Report of Session 2010-2011.' Volume 1.
354. Higson, C., Rivers, O. and Deboo, M. (2007) 'Creative Business – Crafting the Value Narrative.' Centre for Creative Business. See: http://sandbox.ntradmin.com:11438/ntradmin/de-DE/focs/5047_CraftingtheNarrative.pdf (last accessed 11 April 2013).
355. British Film Institute (2012) 'Statistical Yearbook.' London: BFI.
356. Ibid p. 46. Bakhshi, H. and Mateos-Garcia,J. (2009) 'The Money Game.' London: NESTA.
357. In general, the factors that we have described in this section are of greater significance for creative goods, content and platform companies than for those operating in creative services like Advertising and Design. This view, supported to some extent by the findings of the econometric study commissioned by DCMS/BIS (which did not identify significant access to finance SMEs in those sectors) has led the Creative Industries Council Working Group (on which one of this report's authors sits) to focus its recommendations on improving access to finance for content companies, rather than those in services. We suspect (supported by some evidence from the Brighton Fuse research), however, that many creative service companies would like to explore new revenue streams through 'productisation', and yet are unable to do because they are caught in work-for-hire models and the 'IP Poverty Trap'. This warrants attention from policymakers. 'Access to Finance for Creative Industry Businesses.' London: BIS/DCMS.
358. This was the case for 40 per cent of creative content and goods companies, compared with 23 per cent of those working in services (Brighton Fuse).
359. Games Investor Consulting (2009) 'It's Time to Play.' London: NESTA.
360. Avnimelech, G. and Teubal, M. (2004) Venture capital start-up co-evolution and the emergence and development of Israel's new high tech cluster. 'Economics of Innovation and New Technology.' 13(1), 33-60.
361. Bramwell et al., (2012) 'Growing Innovation Ecosystems: University-Industry Knowledge Transfer and Regional Economic Development in Canada.' See: http://www.utoronto.ca/progris/archived_news/pdfdoc/Growing%20Innovation%20Ecosystems15MY12.pdf (last accessed 17 April 2013).
362. See: http://www.creativeengland.co.uk/wp-content/uploads/2012/12/CE-ReportDec2012e-without-Registration1.pdf. (last accessed 11 April 2013).
363. See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32263/12-539-sme-access-external-finance.pdf (last accessed 11 April 2013).
364. SQW (2009) 'The Supply of Equity Finance to SMEs: Revisiting the "Equity Gap".' London: BIS.
365. See: http://www.hm-treasury.gov.uk/ukecon_fundingforlending_index.htm (last accessed 11 April 2013).
366. See: https://www.gov.uk/government/publications/enterprise-finance-guarantee (last accessed 11 April 2013).
367. See: http://www.hm-treasury.gov.uk/nlgs.htm and also http://www.hm-treasury.gov.uk/bfp.htm (last accessed 11 April 2013).
368. See: http://news.bis.gov.uk/Press-Releases/Small-businesses-offered-110-million-of-new-finance-684c2.aspx (last accessed 11 April 2013).
369. See: http://www.seis.co.uk/ (last accessed 11 April 2013).
370. See: http://www.hmrc.gov.uk/eis/ (last accessed 11 April 2013).
371. See: http://www.hmrc.gov.uk/guidance/vct.htm (last accessed 11 April 2013).
372. CfEL also manages the Enterprise Finance Guarantee Scheme. See: http://www.capitalforenterprise.gov.uk/
373. See: http://www.bis.gov.uk/assets/BISCore/business-law/docs/K/12-917-kay-review-of-equity-markets-final-report.pdf (last accessed 11 April 2013).
374. See: http://www.wired.co.uk/news/archive/2012-09/20/opening-up-equity-markets (last accessed 11 April 2013).
375. See: http://www.wired.co.uk/news/archive/2013-02/13/london-stock-exchange-high-growth. The LSE reforms will allow the fast-growing companies to make initial public offerings with just 10 per cent of their stock. The standard requirement of 25 per cent (compared with the equivalent minimum 5 per cent requirement on NASDAQ) has, some have claimed, led some UK businesses to choose to sell out over floating. See also: http://www.telegraph.co.uk/finance/newsbysector/mediatechnologyandtelecoms/9867475/LSE-changes-rules-to-boost-tech-companies-in-Britain.html (last accessed 11 April 2013).

376. See: http://downloads.bbc.co.uk/annualreport/pdf/bbc_executive_2011_12.pdf (last accessed 11 April 2013).
377. See: http://www.official-documents.gov.uk/document/hc1213/hc05/0516/0516.pdf (last accessed 11 April 2013).
378. See: http://www.hmrc.gov.uk/films/ftr-monitoring-summary.pdf (last accessed 11 April 2013).
379. There are also a number of publicly-backed prototype, proof-of-concept and demonstrator funds provided through a variety of agencies like business support agencies and universities to help creative businesses develop their initial ideas, but these are not the focus of this chapter.
380. This cost competitiveness was explained, in part, by the weak British pound at the time of the study. See: http://industry.bfi.org.uk/media/pdf/i/r/The_Economic_Impact_of_the_UK_Film_Industry_-_June_2010.pdf (last accessed 11 April 2013).
381. Nesta (2012) 'Plan I: The Case for Innovation-Led Growth.' London: Nesta.
382. This includes the film fund mentioned above, and other Lottery funding spent on distribution and exhibition, and partnership awards. See: http://www.bfi.org.uk/sites/bfi.org.uk/files/downloads/bfi-annual-report-and-financial-statements-2012-07-17.pdf (last accessed 11 April 2013).
383. See: http://www.official-documents.gov.uk/document/hc1213/hc02/0283/0283.pdf (last accessed 11 April 2013).
384. See: http://www.hmrc.gov.uk/films/ftr-monitoring-summary.pdf (last accessed 11 April 2013).
385. See: http://downloads.bbc.co.uk/aboutthebbc/insidethebbc/howwework/reports/pdf/creative_economy.pdf (last accessed 11 April 2013).
386. In 'Plan I', Nesta argued that public investment on venture capital may have entered diminishing returns. Nesta. (2012) 'Plan I: The Case for Innovation-Led Growth'. London: See: http://www.nesta.org.uk/library/documents/PlanIwebv3.pdf (last accessed 11 April 2013).
387. See: http://www.publications.parliament.uk/pa/cm201011/cmselect/cmbis/561/56108.htm (last accessed 11 April 2013).
388. Burrows, H. and Ussher, K. (2011) 'Risky Business'. London: Demos See: http://www.demos.co.uk/files/Risky_business_-_web.pdf?1320841913 (last accessed 11 April 2013).
389. Bakhshi, H. and Mateos-Garcia, J. (2010) 'The Money Game.' London: NESTA.
390. See: http://www.publications.parliament.uk/pa/cm201213/cmselect/cmcumeds/writev/suppcrec/sce03.htm (last accessed 11 April 2013).
391. See: http://www.hm-treasury.gov.uk/bfp.htm (last accessed 11 April 2013).
392. Creative Industries Council. (2012) 'Access to Finance Working Group Report'. London: Creative Industries Council. See: http://www.creativeengland.co.uk/wp-content/uploads/2012/12/CE-ReportDec2012e-without-Registration1.pdf (last accessed 11 April 2013).
393. Reeves, M. (2002) 'Measuring the economic and social impact of the arts: a review'. London: Arts Council England http://www.artscouncil.org.uk/media/uploads/documents/publications/340.pdf (last accessed 11 April 2013).
394. Oxford Economics (2010) 'The Economic Impact of the UK Film Industry'. London: Oxford Economics.
395. See: http://www.hmrc.gov.uk/tiin/2012/tiin2060.pdf (last accessed 11 April 2013).
396. UK Screen Association (2010) 'The UK Facilities Sector'. London: UK Screen Association. See: http://www.ukscreenassociation.co.uk/pdf/UkScreen-Facilities%20Sector%20Industry%20Report%20-%20FINAL.pdf (last accessed 11 April 2013).
397. Oliver & Ohlbaum Associates Ltd (2011) 'The Role of Terms of Trade in the Development of the UK Independent Production Sector.' A Report for PACT. See: http://webarchive.nationalarchives.gov.uk/20121204113822/http://www.culture.gov.uk/images/consultation_responses/CR2011-PACT_Annex1.pdf (last accessed 11 April 2013).
398. BIS/DCMS (2009) 'Digital Britain' BIS: London. See: http://www.official-documents.gov.uk/document/cm76/7650/7650.pdf (last accessed 11 April 2013).
399. Where new programmes are introduced it will be essential to design pilots that can be rigorously evaluated, using random assignment of business support as was successfully trialled by Nesta in its evaluation of the Creative Credits innovation vouchers scheme. Bakhshi, H., Edwards, J., Roper, S., Scully, J. and Shaw, D. (2011) 'Creating Innovation in SMEs: Evaluating the short-term effects of the Creative Credits pilot.' London: NESTA.
400. There is little independent evidence of this brain drain. However, TIGA, one of the trade bodies for the games industry, estimates that the UK video games workforce shrunk by 10 per cent between 2008 and 2011, with 41 cent of the jobs lost relocating overseas, especially to Canada. See: http://www.tiga.org/news/press-releases/uk-video-games-sector-afflicted-by-brain-drain-of-skilled-staff (last accessed 11 April 2013).
401. Ingenious Media warns of the risk of complacency if policymakers view the tax reliefs as being the panacea of the UK's creative economy. See: http://www.publications.parliament.uk/pa/cm201213/cmselect/cmcumeds/writev/suppcrec/sce03.htm (last accessed 11 April 2013).
402. See: http://grand-nce.ca/newsandmedia/news-container/2011/how-important-is-the-video-game-industry-to-canada-extremely-important.-thats-why-you-should-read-this-report (last accessed 11 April 2013).
403. See: http://www.hm-treasury.gov.uk/d/creative_sector_tax_reliefs_response111212.pdf (last accessed 11 April 2013).
404. For example, Peoplefund.it (http://www.peoplefund.it/) (last accessed 11 April 2013) or Kickstarter (http://www.kickstarter.com/) (last accessed 11 April 2013).
405. Such as Crowdcube (http://www.crowdcube.com/) (last accessed 11 April 2013) or Funding Circle (https://www.fundingcircle.com/) (last accessed 11 April 2013).
406. Such as Marketinvoice (http://marketinvoice.com/) (last accessed 11 April 2013).
407. Gyimah, S. Westlake, S. and Zappalorto, M. (2011) 'Beyond the Banks: the case for a British Industry and Enterprise Bond.' London: NESTA.
408. See: http://www2.lse.ac.uk/researchAndExpertise/units/growthCommission/documents/pdf/LSEGC-Report.pdfPlanI (last accessed 11 April 2013).
409. In 2009, we estimated that 7.5 per cent of high-growth creative businesses accounted for all of the expansion in creative industries employment in the UK over the 2002-2008 period (measured using the DCMS classification of the time). See: http://www.nesta.org.uk/publications/guest_articles/assets/features/ensuring_economic_growth_of_the_uks_creative_industries (last accessed 11 April 2013).
410. Keynes, J.M. (1933) National Self-Sufficiency. 'The Yale Review.' 22(4): 755-769.
411. Smith, M. (2010) 'Arts funding in a cooler climate: Subsidy, commerce and the mixed economy of culture in the UK.' London: Arts and Business.
412. Cowen, T. (2006) 'Good and Plenty: the Creative Successes of American Arts Funding.' Princeton NJ: Princeton University Press.
413. See: http://www.culture.gov.uk/news/ministers_speeches/7633.aspx (last accessed 11 April 2013).

414. Ipsos-Mori (2012) 'Britain 2012: Who do we think we are?' See: http://www.ipsos-mori.com/DownloadPublication/1481_ipsos-mori-britain-2012-who-do-we-think-we-are.pdf (last accessed 17 April 2013). See also Arts Council England (2008) 'What do people want from the arts?' See: http://www.artscouncil.org.uk/media/uploads/downloads/whatpeoplewant.pdf (last accessed 17 April 2013).
415. In 2011, 73.3 per cent of adults visited a heritage site and 47.9 per cent visited a museum or gallery, both significantly higher than five years ago. Over a quarter (26.1 per cent) had visited a museum or gallery website; 77.7 per cent of adults had engaged in the arts themselves, again significantly up on 2005-2006.
416. Although there has in recent years been a general decline in levels of public trust in media and political institutions, more people still trust BBC news journalists than any other group. See: http://yougov.co.uk/news/2012/11/13/problem-trust/ (last accessed 11 April 2013). This despite the fact that in the last ten years the BBC has lost two Directors–General in crisis circumstances: in 2012, George Entwistle resigned in the wake of the scandal about the corporation's handling of the Jimmy Savile affair; in 2004, Greg Dyke resigned following criticism in the Hutton Report of the BBC's reporting of aspects of the Iraq War.
417. Bakhshi, H., Freeman, A. and Hitchen, G. (2009) 'Measuring Intrinsic Value: How to stop worrying and love economics.' Mission, Models, Money.
418. See: http://www.guardian.co.uk/culture/2012/jan/05/david-edgar-why-fund-the-arts (last accessed 11 April 2013). Tusa, J. (1999) 'Art Matters: Reflecting on Culture.'York: Methuen Publishing Ltd.
419. Pung, C., Clarke, A. and Patten, L. (2004) Measuring the economic impact of the British Library. 'New Review of Academic Librarianship.'
420. The other main exception is the Museums, Libraries, Archives study of its footprint in Bolton published in 2005. See Jura Consultants (2005) 'Bolton's Museums, Library and Archives Services: An Economic Valuation.' Edinburgh: Jura Consultants.
421. See: www.hm-treasury.gov.uk/data_greenbook_index.htm (last accessed 11 April 2013).
422. One particular problem arises in the use of so-called multiplier estimates which are used to quantify the indirect economic impacts of organisations through their role in supply chains. If such estimates are added together there is significant double-counting. See Reeves, M. (2002) 'Measuring the economic and social impact of the arts.' London: Arts Council England.
423. For example, PricewaterhouseCoopers (2010) estimated that every £1 of investment in the Creative Partnerships programme generated £15.30 in economic benefit. Shortly after, Arts Council England cut all of its funding for the programme. See: http://www.creativityculture education.org/wp-content/uploads/PWC-report-the-costs-and-benefits-of-creative-partnerships.pdf (last accessed 11 April 2013).
424. Hutter, M. and Throsby, D. (Eds.) (2008) 'Beyond Price: Value in Culture, Economics and the Arts.' Cambridge: Cambridge University Press.
425. Uknea.unep-wcmc.org/ (last accessed 11 April 2013).
426. See: http://www.ahrc.ac.uk/News-and-Events/News/Pages/Project-to-understand-the-value-of-arts-and-culture.aspx (last accessed 11 April 2013). One of this manifesto's authors is on the advisory board for this project.
427. Bakhshi, H. (2012) The Impact of the 'Valuing Culture' Debates in the UK, 2003-2011. 'Cultural Trends.' 21(3): 213-214
428. Fleming, T. and Erskine, A. (2011) 'Arts and the Economy: supporting growth in the arts economy.' London: Arts Council of England.
429. Researchers have only recently begun to quantify the spillover benefits of the arts to the UK's creative economy e.g. Bakhshi, H., Lee, N. and Mateos-Garcia, J. (2013) 'Capital of Culture.' Brookings/Nesta, forthcoming.
430. For a review of the linkages see Holden, J. (2007) 'Publicly-funded culture and the creative industries.' London: Demos.
431. Bakhshi, H., Mateos-Garcia, J. and Throsby, D. (2010) 'Beyond Live: Digital innovation in the performing arts.' London: NESTA. Bakhshi, H. and Throsby, D. (2013) Digital Complements or Substitutes?: A Quasi-field Experiment from the Royal National Theatre. 'Journal of Cultural Economics.'
432. Bakhshi, H. and Throsby, D. (2010) 'Culture of Innovation: An Economic Analysis of Arts and Cultural Organisations.' London: NESTA.
433. Through its sponsorship of Radio 3; five orchestras, the BBC singers and major festivals such as the BBC Promenade Concerts.
434. See: http://downloads.bbc.co.uk/bbctrust/assets/files/pdf/about/how_we_govern/charter.pdf (last accessed 11 April 2013).
435. See: http://www.guardian.co.uk/media/2009/apr/20/bbc-archives (last accessed 11 April 2013).
436. See: http://downloads.bbc.co.uk/aboutthebbc/policies/pdf/bpv.pdf (last accessed 11 April 2013).
437. See: http://www.europeana.eu (last accessed 11 April 2013).
438. See: http://www.bbc.co.uk/blogs/aboutthebbc/posts/one-square-at-a-time (last accessed 11 April 2013).
439. See: http://www.guardian.co.uk/media/2013/jan/06/bbc-digital-public-space-archive (last accessed 11 April 2013).
440. Bakhshi, H. and Throsby, D. (2010) 'Culture of Innovation: an economic analysis of innovation in arts and cultural organisations.' London: NESTA.
441. Bakhshi, H. and Pugh, A. (2011) 'An analysis of applications for the Digital R&D Fund for Arts and Culture.' London: NESTA.
442. Nesta (2012) 'Analysis of applications for the Digital R&D Fund for Arts and Culture Scotland: First Call.' London: Nesta.
443. Committee for Culture, Arts & Leisure (2013) 'Inquiry on Maximising the Potential of the Creative Industries Volume Three: Research Papers and Additional Information.' See: http://www.niassembly.gov.uk/Documents/Reports/Culture-Arts-and-Leisure/Creative%20Industries/creative%20industry%20vol%203.pdf (last accessed 17 April 2013).
444. In February 2013, the British Museum announced that it would for the first time broadcast a museum exhibition to cinemas: its 'Life and Death in Pompeii and Herculaneum' exhibition. See: http://www.britishmuseum.org/whats_on/exhibitions/pompeii_and_herculaneum/pompeii_live.aspx (last accessed 11 April 2013).
445. MTM London (2009) 'Arts Council England - Digital Content Snapshot.' London: MTM London. See: http://www.artscouncil.org.uk/media/uploads/downloads/MTM-snapshot.pdf (last accessed 17 April 2013).
446. Fleming, T. and Erskine, A. (2011) 'Arts and the Economy: supporting growth in the arts economy.' London: Fleming and Erskine, Arts Council England.
447. Bakhshi, H., Desai, R. and Freeman, A. (2009) 'Not Rocket Science: A Roadmap for Arts and Cultural R&D.' Mission, Models, Money.
448. Knell, J. (2007) 'The Art of Living.' Missions, Models, Money.
449. Lilley, A. and Moore, P. (2013) 'Counting What Counts: What Big Data Can do for the Cultural Sector.' London: Arts Council England/Nesta. See: http://www.nesta.org.uk/library/documents/CountingWhatCountsPaperWV.pdf (last accessed 11 April 2013).

450. The cultural and social ramifications of open access to data and other forms of knowledge, not least through the stimulus of fan networks, is a large subject in its own right and not confined by these managerial approaches to data management. The picture is set out in: Jenkins, J. (2006) 'Convergence Culture, where old and new media collide.' New York: New York University Press.
451. Knell, J. (2007) 'The Art of Living.' Missions, Models, Money.
452. Bakhshi, H. and Mateos-Garcia, J. (2012) 'Rise of the Datavores: How UK businesses analyse and use online data.' London: Nesta.
453. Bakhshi, Freeman and Hitchen op. cit.
454. Sheff, D. (1999) 'Game over: Nintendo's battle to dominate an industry.' London: Hodder and Stoughton.
455. Cusumano, M, and Yoffie, M. (1998) 'Competing on Internet Time: Lessons from Netscape and Its Battle with Microsoft.' New York: Simon & Schuster.
456. As we discussed in Box 4.1, our definition of Internet platforms emphasises the fact that they can be extended, but it does not prescribe what the augmentation entails – whether it is provision of goods or services as with e-commerce sites, applications in the case of operating systems, or user-generated content in social networks.
457. Speech by Lord Currie, chairman designate of the CMA, calling for "enhanced partnership" with specialist economic regulators. 28 November, 2012. See: http://news.bis.gov.uk/Resource-Library/Keynote-Speech-by-Lord-Currie-of-Marylebone-Chairman-designate-Competition-Markets-Authority-28-17ca.aspx (last accessed 17 April 2013).
458. This is also of course one of the reasons why policymakers see the creative industries as a sector with high growth potential. Shapiro, C. and Varian, H. L. (1999) 'Information Rules: A Strategic Guide to the Network Economy.' Boston: HBS Press. Gans, J. (2010) 'Information Wants to be Shared.' Boston MA: Harvard Business School Press. Freedman (2012) gives a more critical view, arguing that the variable costs of marketing products online should not be underestimated, Freedman (2012) 'Web 2.0 and the death of the blockbluster economy.' In Curran, J., Fenton, N. and Freedman, D. (2012) 'Misunderstanding the Internet.' Oxford: Routledge.
459. Fathom Financial Consulting (2007) 'Understanding the rationale for publicly backed investment funds in the creative content industries.' London: Nesta. Hirsch, P. M. (1972) Processing Fads and Fashions. 'American Journal of Sociology.' 77 (1972):639-659. Bakhshi, H., Mateos-Garcia, J. and Gatland, T. (2010) 'The Money Game - Project finance and video games development in the UK.' London: NESTA.
460. Bakker, G. (2012) 'Sunk costs and the dynamics of creative industries.' Economic History working papers, 172/12, London School of Economics. See: http://eprints.lse.ac.uk/49081/ (last accessed 11 April 2013).
461. Payola is the illegal practice in the US of cash or in-kind payment by record companies for the broadcasting of recordings on radio.
462. See: http://www.bfi.org.uk/statisticalyearbook2012/ (last accessed 11 April 2013).
463. See: http://www.complex.com/music/2012/05/major-labels-see-decline-in-global-market-share-as-independents-grow (last accessed 11 April 2013).
464. See: http://www.keynote.co.uk/market-intelligence/view/product/10419/book-publishing (last accessed 11 April 2013).
465. Frontier Economics (2007) 'Creative industry performance: A statistical analysis for the DCMS.' London: Frontier Economics. See: http://webarchive.nationalarchives.gov.uk/20100512144753/http://www.culture.gov.uk/images/research/Statistical_Analysis_of_the_Creative_Industries_Frontier_Economics_2007.pdf (last accessed 11 April 2013).
466. Krukowski, D. (2012) Making Cents. 'Pitchfork.' See: http://pitchfork.com/features/articles/8993-the-cloud/ (last accessed 11 April 2013).
467. In such instances, the traditional difficulties that IP-based businesses face in accessing external finance means that creators cannot break out of the trap. See the discussion of access to finance in Chapter Seven.
468. Kretschmer, M. and Hardwick, P. (2007). 'Authors' Earnings from Copyright and Non-Copyright Sources: A survey of 25,000 British and German writers.' Centre for Intellectual Property Policy & Management. See: http://www.cippm.org.uk/downloads/ACLS%20Full%20report.pdf (last accessed 17 April 2013).
469. See: http://www.the-digital-reader.com/2013/02/05/myth-the-ebook-market-will-be-won-on-hardware/ (last accessed 11 April 2013).
470. Freedman (2012) op. cit.
471. See: http://www.billboard.biz/bbbiz/industry/digital-and-mobile/business-matters-what-is-itunes-u-s-market-1007954082.story (last accessed 11 April 2013).
472. Interview with Joaquin Almunia in Barker, A. and Waters, R. (2013) Brussels takes light-touch stance on Google. 'Financial Times.' 10 January 2013.
473. Curran, J., Fenton, N. and Freedman, D. (2012) 'Misunderstanding the Internet.' Oxford: Routledge.
474. Evans, D. and Schmalensee, R. (2001) 'Some economic aspects of antitrust analysis in dynamically competitive industries.' NBER working paper W8628. Cambridge MA: NBER.
475. In 2012, Ofcom reports that 19 per cent of UK consumers switched at least one communications service in the previous 12 months. Ofcom (2013) 'The Consumer Experience 2012.' London: Ofcom.
476. Core Ofcom statement of principles, re-stated in its current Annual Plan for 2013/2014.
477. Eisenmann,T. Parker, G. and Van Alstyne, M. (2010) 'Platform Envelopment.' Harvard Business School Working Paper 07-104. See: http://www.hbs.edu/faculty/Publication%20Files/07-104.pdf (last accessed 11 April 2013).
478. Of course, this kind of behaviour is not exclusive to Internet platforms: large-scale conglomerates have always been able to leverage and cross-promote successful franchises across several distribution channels, media and geographical markets. For example, News Corporation's media holdings include print publications such as the 'Wall Street Journal' and the 'New York Post', book publisher HarperCollins, film studio 20th Century Fox as well as its myriad television and cable networks.
479. See: http://en.wikipedia.org/wiki/List_of_mergers_and_acquisitions_by_Google#cite_note-1 http://www.businessinsider.com/google-acquisitions-2010-9 (last accessed 11 April 2013).
480. Google has bought more than 100 SMEs since 2001, including 26 in 2011 alone. Although this can also act as an indirect spur for innovation by providing entrepreneurs and investors with the goal of lucrative exit, the prospect of such rewards can also discourage entrepreneurs from building up sustainable businesses – a longstanding concern in the UK.
481. Steadman, I. (2012) European Commision stops its investigation into e-books price fixing. 'Wired.' 13 December 2012.
482. See: http://forum.icann.org/lists/comments-closed-generic-05feb13/msg00207.html (last accessed 11 April 2013).
483. US Clears Google's core search business. 'Financial Times.' 03 January 2013.
484. Interview with Joaquin Almunia in Barker, A. and Waters, R. (2013) Brussels takes light-touch stance on Google. 'Financial Times.' 10 January 2013.
485. *"We are not discussing the algorithm"* said Mr Almunia in the FT interview noted above.

486. Google to pay €60m to French media fund. 'Financial Times.' 1 February 2013.
487. A version of this case (Foster, R. (2012) 'News Plurality in a Digital World.' Oxford: Reuters Institute for the Study of Journalism.) has been made in the UK with regard to Google's impact upon markets which involve the provision and distribution of news, though the main focus in this study is upon the issue of plurality of supply rather than competition. The study suggests a range of voluntary actions, such as establishing "an independent news investment fund" to which Internet platforms might contribute. It further suggests that Internet platforms should be included in Ofcom's plurality review framework and invites the Government to consider providing backstop regulatory powers to deal with a hypothetical situation where the platforms turned out, over time, to have their own editorial agenda, in the way that is considered routine with publishers of newspapers.
488. Battle Lines Drawn in Online Search War. 'Financial Times.' 17 January 2013, citing figures from ZenithOptimedia.
489. Sarah Hunter, Head of UK Policy for Google, gave evidence to House of Commons Culture Media and Sport Committee on 18 December 2012. She gave up to date information on measures taken to deal with illegal content on YouTube and said that *"last month we removed 9 million URLs from our web index. Just as a matter of scale, a few years ago there was in the tens of thousands in a year, and now it is nine million in a month. So this system is going a long way to meeting the concerns that they [rights holders] have."* Some rights holders have complained that Google is still not doing enough. In February 2013, for example, the Recording Industry Association of America released a 'report card' concluding that *"...we have found no evidence that Google's policy has had a demonstrable impact on demoting sites with large amounts of piracy. These sites consistently appear at the top of Google's search results for popular songs or artists."* RIAA (2013)'Six Months Later – A Report Card on Google's Demotion of Pirate Sites.' Washington DC: RIAA.
490. Shapiro, C. and Varian, H. L. (1999) 'Information Rules: A Strategic Guide to the Network Economy.' Boston: HBS Press. Note the challenges in distinguishing between monopoly profit and quasi-profits, and have been critical in the way US anti-trust authorities have approached the issue, arguing that the presence of locked-in customers has been taken as a sign of market power without considering the profitability of the customer through the lock-in cycle as a whole. See also Thépot (2012) 'Market Power in Online Search and Social–Networking: a Matter of Two–Sided Markets.' CLES working paper series, April 2012, Faculty of Laws, UCL.
491. See, for example, Black, G. (2012) Big Data: crude oil of our time. 'Cosmos Magazine.' 2 November 2012.
492. Simon Milner, Facebook's Director of Policy for the UK and Ireland, asked by the House of Commons Culture Media and Sport Committee in December 2012 how Government could help Facebook contribute more to the UK creative economy replied: *"One of the things that they could help us with is around some laws that are going to matter for all industry in the UK, including the creative industries, around the use of data. I cannot think of any company in any industry, or any artist, who would not benefit from having more data about what people enjoy, about the content they are producing, how they use it and how they share it, and to make use of that data in more imaginative ways. There are things coming down the track, particularly from Europe, around data laws. For platforms like ours, and also many other businesses that are built around platforms like Google and Facebook, it will be difficult to innovate in a too restrictive environment. One of the ways that Government can help — and indeed is helping already — is to say, "Let us not have overly restrictive laws around data, and the way in which companies handle data. Let us get the balance right between privacy and innovation". So the Government is making that case, and we hope it will continue to make that case next year, which will be an extremely important year for data privacy regulation in Europe."*
493. See: http://www.wired.co.uk/news/archive/2011-02/02/oft-ebook-pricing (last accessed 11 April 2013).
494. This list is not exhaustive. The Information Society Directive and the Audio Visual Media Services Directives are also relevant.
495. See: http://www.echr.coe.int/ECHR/EN/Header/Basic+Texts/The+Convention+and+additional+protocols/The+European+Convention+on+Human+Rights/ (last accessed 11 April 2013).
496. See: http://ec.europa.eu/internal_market/e-commerce/directive/index_en.htm (last accessed 11 April 2013).
497. See: http://europa.eu/legislation_summaries/information_society/legislative_framework/l24216a_en.htm (last accessed 11 April 2013).
498. Ofcom (2011) 'Ofcom's Approach to Net Neutrality.' London: Ofcom. See: http://stakeholders.ofcom.org.uk/binaries/consultations/net-neutrality/statement/statement.pdf (last accessed April 17 2013).
499. Ofcom's approach appears to be consistent with that advocated by Professor Tim Wu of the Massachussetts Institute of Technology, who compares the feasibility of a neutral public network operating alongside a premium traffic network for specific commercial usage with arrangements in the electricity supply sector. Wu, T. (2011). 'The master switch: The rise and fall of information empires.' New York: Vintage Books. Wu comments: *"the basic justification for any law on network neutrality is an economic justification – preventing behavior that may be narrowly beneficial for the carrier but that has negative spillovers for the economy and the nation."*
500. Undoubtedly some creative businesses have concerns about the terms on which they trade with Internet platform giants like Google, Apple and Amazon. In the UK, the music industry has arguably been the most vocal. In book publishing, though there are concerns, the transition to digital, so far, appears to have been less fractious. In the film and television industry, there have been spats between platforms and rights holders, including the notorious nine-month row in the US between iTunes and NBC beginning in December 2007 which resulted in a temporary removal of all NBC content (at that time accounting for 40 per cent of all video content) from the Apple's iTunes store. Danaher, B., Dhanasobhon, S., Smith, M. and Telang, R. (2008) 'Converting Pirates without Cannibalizing Purchasers: The Impact of Digital Distribution on Physical Sales and Internet Piracy.' Heinz Research. Paper 57. See: http://repository.cmu.edu/cgi/viewcontent.cgi?article=1056&context=heinzworks (last accessed 11 April 2013).
501. This work is well under way. Ofcom published its first wave of research results in late 2012 and is expected to continue to publish further findings in the course of 2013.
502. In March 2013, the government announced that it had made £150,000 available for the first phase of the Copyright Hub. See: http://www.thecmuwebsite.com/article/government-provides-funding-for-phase-one-of-copyright-hub/ (last accessed 11 April 2013).
503. IPO-OFT (2012) 'Memorandum of Understanding between the Intellectual Property Office and the Office of Fair Trading.' See: http://www.oft.gov.uk/shared_oft/MoUs/IPO.pdf (last accessed 11 April 2013).
504. Yochai Benkler (2006), for example, argues that what *"the emerging networked information economy therefore needs, in almost all cases, is not regulatory protection, but regulatory abstinence."* Benkler, Y. (2006) 'The Wealth of Networks: How Social Production Transforms Markets and Freedom.' New Haven: Yale University Press.
505. In the next decade when regulators will be faced with having to regulate the move from single application networks to far more sophisticated multi-application networks (next-generation access networks) with services running across multiple layers simultaneously of the Internet protocol stack, it will become increasingly important for national regulatory authorities such as Ofcom to have the necessary economic and technical expertise to help define relevant markets on a periodic basis and far more flexibly so as to be able to address potential anti-competitive practices that might arise in this sector in the future. See: Kariyawasam R. (2012) 'Better Regulation of Internet Markets.' In Cottier, T. and Burri, M. (Eds.) (2012)'Trade Governance for the Digital Age.' Cambridge: Cambridge University Press.

506. See: http://stakeholders.ofcom.org.uk/market-data-research/other/telecoms-research/copyright-infringement-tracker/ (last accessed 11 April 2013).
507. Ofcom (2013) 'Annual Plan 2013/2014.' Paragraph 3.67. Available at: http://www.ofcom.org.uk/files/2013/03/annplan1314.pdf (last accessed April 11 2013). In the preceding paragraph, Ofcom says that its response to continued globalisation and the growth of Internet-based service delivery *"will need to focus more on international engagement, liaison and influence to achieve good outcomes for UK consumers and citizens. This will affect many issues, including audience and consumer protection, measures to address online copyright infringement, traffic management, data protection, Internet governance, content investment and new competition concerns."*
508. Boldrin, M. and Levine, D.K. (2008) 'Against Intellectual Monopoly.' Cambridge: Cambridge University Press.
509. See, for example: Social Science Research Council (2011) 'Media Piracy in emerging economies.' Or Ofcom's first online copyright infringement tracker benchmark study, Q3 2012, which provides evidence of confusion as well as levels of prevalence of illegal activity (http://stakeholders.ofcom.org.uk/market-data-research/other/telecoms-research/copyright-infringement-tracker/). Also Consumer Focus: http://www.consumerfocus.org.uk/news/outdated-copyright-law-confuses-consumers (last accessed 11 April 2013).
510. That is, copyright without 'formalities', meaning the need for rights holders to register their claims.
511. Testimony transcript available at: http://cryptome.org/hrcw-hear.htm (last accessed 11 April 2013).
512. Waterman, D. (2005) 'Hollywood's Road to Riches.' Cambridge: Cambridge University Press.
513. The founding manifesto text is perhaps John Perry Barlow's 'A Declaration of the Independence of Cyberspace.' https://projects.eff.org/~barlow/Declaration-Final.html, last accessed 17 April 2013. Barlow co-founded the Electronic Frontier Foundation. The roster of names working in this tradition is extensive and would include writers such as Lawrence Lessig; Yochai Benkler, James Boyle and Clay Shirkey.
514. Boyle, J. (2008) 'The Public Domain: Enclosing the Commons of the Mind.' New Haven CT: Yale University Press.
515. Jefferson, the 3rd President of the US, was also a sceptical pioneer of patent examination, famously proclaiming: *"He who receives an idea from me, receives instruction himself without lessening mine: as he who lights his taper at mine, receives light without darkening me."*
516. Hargreaves, I. (2011) 'Opportunity: A Review of Intellectual Property and Growth.' See: www.ipo.gov.uk/hargreaves (last accessed 11 April 2013).
517. Hargreaves (2011) op. cit., page 1.
518. IPO (2011) 'Government Response to the Hargreaves Review of Intellectual Property and Growth.' Cardiff: IPO. There has been debate about the economic impact assessment referred to here, not least since the publication in December 2012 of revised economic impact assessments, conducted using a different methodology, arising from key elements of the proposed copyright reforms. This debate has been aired in hearings of the House of Commons Culture Media and Sport Committee during its inquiry into Support for the Creative Industries. See: http://www.parliament.uk/business/committees/committees-a-z/commons-select/culture-media-and-sport-committee/ (last accessed 11 April 2013).
519. Hooper, R. and Lynch, R. (2012) 'Rights and Wrongs, The First Report of the Digital Copyright Exchange Feasibility Study.' IPO; 'Copyright Works, Streamlining copyright licensing for the digital age.' Newport: IPO. See: http://www.ipo.gov.uk/dce-report-phase1.pdf (last accessed 11 April 2013).
520. Hooper, R. and Lynch, R. (2012) 'Rights and Wrongs, The First Report of the Digital Copyright Exchange Feasibility Study.' Newport: IPO. Page 4
521. See: http//services.parliament.uk/bills/2012-13/enterpriseandregulatoryreform.html (last accessed 11 April 2013). See Part 6 of the Bill.
522. IPO (2012) 'Modernising Copyright: a modern, robust and flexible framework.' Government response to consultation on copyright exceptions and clarifying copyright law. P 1. Newport: Intellectual Property Office.
523. The Stop Online Piracy Act and the Protect IP Act.
524. Anti-Counterfeiting Trade Agreement.
525. See: http://www.theregister.co.uk/2012/08/08/french_minister_says_3_strikes_copyright_infringement_rule_is_a_waste_of_money/ (last accessed 11 April 2013).
526. Hadopi's own figures (according to a Parliamentary reply made by the Minister of Justice) show that it by the end of 2012 it had issued 1.15 million warnings, resulting in a mere 14 cases passed to local prosecutors, of which only one had resulted in a fine (of €150). The annual running costs of Hadopi are reported to be €12 million (www.musiclawupdates.com/?p=5092) (last accessed 11 April 2013). September 2012.
527. The latest developments in the European Commission's proposals for reforming copyright are explained in Chapter 10. The flavour of the (familiar) argument between those focused upon defending existing rights and those focused upon change is captured in: Rooney, B. (2012) Kroes calls for copyright reform. 'Wall Street Journal Tech.' September 11, 2012. See: www.blogs.wsj.com/tech-europe/2012/09/11 (last accessed 11 April 2013).
528. Theile M. (2012) 'The Economic Impact of a Digital Single Market.' Copenhagen Economics. Presentation to Seizing the Digital Opportunity conference, Stockholm, 20 January, 2012. Copenhagen Economics. (2010) 'The economic impact of a European digital single market'. Copenhagen: Copenhagen Economics. See: http://www.epc.eu/dsm/2/Study_by_Copenhagen.pdf (last accessed 11 April 2013).
529. See: http://ec.europa.eu/information_society/policy/ecomm/tomorrow/index_en.htm (last accessed 11 April 2013).
530. 'Commission agrees way forward for modernising copyright in the digital economy.' 5 December 2012. See: http://europa.eu/rapid/press-release_MEMO-12-950_en.htm?locale=en (last accessed 11 April 2013).
531. M Barnier said: *"there can be neither taboo subjects nor miracle solutions"* but that he had *"great hope"* for the proposed licensing initiative. 6 December 2012. See: Http://europa.eu/rapid/press-release_SPEECH-12-923_en.htm?locale=en (last accessed 11 April 2013). Barnier's critics, however, accuse him of using the licensing initiative as a means of avoiding reform of copyright law (see, for example: Baker, J. (2013) EU copyright reform talks a waste of time, says digital rights group. 'IT World.' 4 February 2013.
532. A substantial set of stakeholders involved in the working group on text and data mining has issued a very strong letter of protest at the conduct of the proceedings: See: http://www.libereurope.eu/news/licences-for-europe-a-stakeholder-dialogue-text-and-data-mining-for-scientific-research-purpose (last accessed 11 April 2013).
533. See: http://www.eu2013.ie/media/eupresidency/content/speeches/Richard-Bruton-JURI-22-JAN.pdf (last accessed 11 April 2013).
534. A further indication of the shifting political mood about IP rights can be gauged from the comments of Marietje Schaake MEP, Rapporteur on the EU's Digital Freedom Strategy. *"I would invite and encourage everyone who does not like the current intellectual property rights enforcement mechanism in Europe, and I am certainly one of them, to be a part of thinking about how it should be done".* See: http://www.vieuws.eu/ict/intellectual-property-rights-ipr-marietje-schaake-mep-alde/ (last accessed 11 April 2013).

535. In February 2013, 25 EU states signed up to the unified European Patent jurisdiction, but much work remained to be done to implement the agreement in practice.
536. Statement to the US House of Representatives, 113th Congress, First Session, March 20, 2013.
537. See: http://www.telegraph.co.uk/technology/google/9472228/Victory-for-music-and-film-industries-as-Google-begins-piracy-crackdown.html (last accessed 11 April 2013).
538. See, for example RIAA (2013)'Six Months Later – A Report Card on Google's Demotion of Pirate Sites.' Washington DC: RIAA.
539. 'Google to pay €60 million into French media fund.' Financial Times. 1 February 2013.
540. See: http://www.informationweek.co.uk/government/policy/germany-wants-to-charge-google-for-news/240005926 (last accessed 11 April 2013).
541. Patry, W. (2012) 'How to Fix Copyright.' Oxford: Oxford University Press. P.262.
542. Levine, R. (2011) 'Free Ride.' London: Bodley Head. Pg. 247.
543. Bakhshi, H., Freeman, A. and Higgs, P. (2013) 'A Dynamic Mapping of the UK's Creative Industries.' London: Nesta. Estimate that the number of people involved in creative occupations outside the creative industries grew by 10.6 per cent in the six years to 2010, compared with 6.5 per cent in the creative industries.
544. Autor, D. Levy, F. and Murnane, R. (2003) The Skill Content of Recent Technological Change: An Empirical Exploration. 'Quarterly Journal of Economics.' 118(4): 1279-1334.
545. Bloom, N., Sadun, R. and Van Reenen, J. (2012) Americans Do IT Better: US Multinationals and the Productivity Miracle. 'American Economic Review.' 102(1): 167-201.
546. Staying Ahead.
547. Hopkins, L. and Levy, C. (2012) 'Simply the Best? Highly-Skilled Migrants and the UK's Knowledge Economy.' London: The Work Foundation.
548. Bakhshi, H. and Mateos-Garcia, J. (2012) 'Rise of the Datavores: How UK businesses analyse and use online data.' London: Nesta.
549. NESTA (2011) 'Next Gen.' London: NESTA.
550. See: http://www.skillset.org/uploads/pdf/asset_17117.pdf?1 (last accessed 11 April 2013).
551. Brighton Fuse.
552. See: http://www.skillset.org/uploads/pdf/asset_15385.pdf?1 (last accessed 11 April 2013).
553. Creative Industries Council Skillset Skills Working Group Appendices (2012). See: http://cicskills.skillset.org/the-report (last accessed 11 April 2013).
554. Ibid.
555. Lester, R. and Piore, M. (2004) 'Innovation: the Missing Dimension.' Cambridge MA: Harvard University Press.
556. A previous Nesta study has drawn attention to the overlap between this interpretative skill set and the creative working method of fine artists. Oakley, K., Sperry, B. and Pratt, A. (2008) 'The Art of Innovation: How fine arts graduates contribute to innovation.' London: NESTA.
557. Hargadon, A. (2003) 'How Breakthroughs Happen: The Surprising Truth About How Companies Innovate.' Harvard Business School Press; Johnson, S. (2010) 'Where Good Ideas Come From: The Natural History of Innovation.' Riverhead Trade.
558. Burt, R. (1995) 'Structural Holes: The Social Structure of Competition.' Cambridge MA: Harvard University Press.
559. Brown, J. S. and Duguid, P. (2002) 'The Social Life of Information.' Boston MA: Harvard Business Press.
560. McWilliam, E. and Dawson, S. (2008) Teaching for creativity: towards sustainable and replicable pedagogical practice. 'Higher Education.' 56(6), 633-643.
561. Caves, R.E. (2002) 'Creative Industries: Contracts Between Arts and Commerce.' Cambridge MA: Harvard University Press.
562. See: http://vimeo.com/19293381 (last accessed 11 April 2013).
563. Valve (2012) 'Handbook for New Employees.' See: http://www.valvesoftware.com/company/Valve_Handbook_LowRes.pdf (last accessed 11 April 2013).
564. See: http://www.gamezone.com/products/assassin-s-creed-iii/news/assassin-s-creed-3-marks-biggest-launch-ever-in-ubisoft-history (last accessed 11 April 2013).
565. See: http://mediafieldsjournal.squarespace.com/storage/issue2/ricklefs/Media-Fields-2-Chung.pdf (last accessed 11 April 2013).
566. NESTA (2006) 'Creating Growth.' London: NESTA.
567. See: http://eamesdesigns.com/eames-spotting-article/charles-eames-in-15-quotes-for-his-105th-birthday/ (last accessed 11 April 2013).
568. See: www.hyperisland.com. (last accessed 11 April 2013).
569. Criticisms include high drop-out rates. For a round-up of critiques: http://edtechdev.wordpress.com/2012/05/04/whats-the-problem-with-moocs/ (last accessed 11 April 2013). For contrast, take Clay Shirkey's blog on MOOCs, which hails them as the much needed challenge to over-priced university courses. See: http://www.shirky.com/weblog/2012/11/napster-udacity-and-the-academy/ (last accessed 11 April 2013).
570. See: https://www.coursera.org/ (last accessed 11 April 2013).
571. See: http://futurelearn.com/ (last accessed 11 April 2013).
572. See: http://stackoverflow.com/ (last accessed 11 April 2013).
573. NESTA (2011) 'Next Gen.' London: NESTA. See also Royal Society (2012) 'Shut Down or Restart.' The plight of computer science in education has been nothing short of disastrous – with a 23.3 per cent drop in the number of computer science undergraduates in the UK between 2002 and 2012, and a 33.8 per cent drop in the number of students at graduate level. At postgraduate level, computer science is the only area to have experienced a decline in numbers over this period apart from agriculture-related subjects. See: http://www.nextgenskills.com/new-figures-reveal-crash-in-computer-science-degrees/ (last accessed 11 April 2013).
574. See: http://designmuseum.org/media/item/79241/4288/Design-Commission-Restarting-Britain-Design-Education-and-Growth.pdf (last accessed 11 April 2013).
575. See: http://www.dcms.gov.uk/publications/8875.aspx (last accessed 11 April 2013).
576. See: http://www.dcms.gov.uk/publications/8875.aspx (last accessed 11 April 2013).
577. The Cultural Learning Alliance, chaired by Lord Puttnam, said at the launch of the Henley Review and the Ministerial response: *"the statutory place of the arts in schools has to be one of the critical components of any future plan for cultural learning. For Henley's vision to become reality, the government must make sure that it takes these recommendations on board."* See: http://www.guardian.co.uk/culture-professionals-network/culture-professionals-blog/2012/feb/29/henley-review-cultural-education (last accessed 11 April 2013).

578. See: http://www.policyconnect.org.uk/sites/default/files/Design-Commission-report_SP(1).pdf (last accessed 11 April 2013).
579. See: http://cicskills.creativeskillset.org/data/the_creative_industries_council_skillset_skills_group_report (last accessed 11 April 2013). One of this report's authors is a member of this working group.
580. See: http://www.nesta.org.uk/library/documents/ParentCYPCGIVFXreport.pdf (last accessed 11 April 2013).
581. Nesta (2012) 'Decoding Learning.' London: Nesta.
582. See, for example http://www.ofsted.gov.uk/resources/ict-schools-2008-11 (last accessed 17 April 2013).
583. CIHE (2010) 'The Fuse.' London: CIHE.
584. See: http://www.educationscotland.gov.uk/thecurriculum/whatiscurriculumforexcellence/index.asp (last accessed 11 April 2013).
585. See for example, Priestley, M. and Minty, S. (2012) 'Developing Curriculum for Excellence: Summary of findings from research undertaken in a Scottish local authority.' Stirling: University of Stirling. See: http://www.ioe.stir.ac.uk/research/projects/documents/StirlingCfEresearch-report_March2012.pdf (last accessed 11 April 2013).
586. The Pisa rankings are published by the OECD at www.oecd.org/pisa/pisaproducts. In the most recent tabulations, the UK ranked 25th on a basket of comparisons involving numeracy and literacy. Wales, in results based on 2009 data, ranked 30th out of 67 countries in science, 38th in reading and 40th in maths. See: www.tes.co.uk/article.aspx?storycode=6261843. (last accessed 11 April 2013).
587. See: http://www.creativeskillset.org/uploads/pdf/asset_14496.pdf (last accessed 11 April 2013).
588. Skillset (2011) 'Sector Skills Assessment for the Creative Media Industries in the UK, January 2011'. See: http://www.skillset.org/uploads/pdf/asset_16297.pdf (last accessed 11 April 2013).
589. See: http://cicskills.skillset.org/the-report (last accessed 11 April 2013).
590. Hargreaves, I. and Grant, A. (2011) 'Creative Industries in the South Wales Valleys.' University of the Heads of Valleys Institute.
591. NESTA (2011) 'Next Gen.' London: NESTA.
592. Creative Industries Council Skillset Skills Group (2012) 'Report to the Creative Industries Council.' London: The CIC Skillset Skills Group.
593. Creative Industries Council Skillset Skills Working Group Appendices (2012). See: http://cicskills.skillset.org/the-report (last accessed 11 April 2013).
594. The superior performance of graduates from accredited courses in the labour market in industries such as games suggests that the scheme has been successful. (NESTA (2011) 'Next Gen.' London: NESTA.)
595. See: http://www.brightonfuse.com/wp-content/uploads/2012/02/Brighton-fuse-universities-and-cdit-clusters.pdf (last accessed 11 April 2013).
596. See: http://cicskills.creativeskillset.org/the-report (last accessed 11 April 2013).
597. Ball, L., Pollard, E. and Stanley, N. (2010) 'Creative Graduates Creative Futures.' Institute of Employment Studies, University of Warwick; Universities UK (2010) 'Creating Prosperity: the role of higher education in driving the UK Creative Economy.' London: Universities UK. Bakhshi, H. (Ed.), Oakley, K., Sperry, B. and Pratt, A. (2008) 'The Art of Innovation: How fine arts graduates contribute to innovation.' London: NESTA. See: http://www.nesta.org.uk/library/documents/Report%2016%20-%20Art%20of%20Innovation%20v11.pdf (last accessed 11 April 2013).
598. BIS (2010)'Securing a Sustainable Future for Higher Education'. See: http://www.bis.gov.uk/assets/biscore/corporate/docs/s/10-1208-securing-sustainable-higher-education-browne-report.pdf (last accessed 11 April 2013).
599. See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32409/11-944-higher-education-students-at-heart-of-system.pdf (last accessed 11 April 2013).
600. The Cabinet Secretary, in his guidance letter on the 2011 spending review and the settlement for higher education noted: *"With regard to our proposals on fees for students from the rest of the UK (RUK) it is important that the Council protects those subjects where changes to RUK fees do not adequately reflect the costs of provision. I would, therefore, ask that you allocate additional resources to ensure that we protect … (ii) our small specialist institutions, particularly those that play a key role in Scotland's creative industries"* (Guidance Letter to the Scottish Funding Council from Cabinet Secretary on Comprehensive Spending Review, 2011).
601. (2012) 'Creative Industries Council Skillset Skills Group: report to the Creative Industries Council.' There are some important exceptions like textiles. As it is, FE students in creative subjects provide a substantial feed into university creative courses, save for those cases where the skills involved in the course are of a tightly defined craft character (such as make-up).
602. See: http://ccskills.org.uk/news/story/creative-cultural-skills-to-run-creative-employment-programme-for-arts-coun (last accessed 11 April 2013). One of this report's authors is a member of New Deal of the Mind's board.
603. Which means these organisations do not capture all the returns from productivity improvements in their workforce.
604. See: http://cicskills.skillset.org/data/the_creative_industries_council_skillset_skills_group_report (last accessed 11 April 2013).
605. (2012) 'Creative Industries Council Skillset Skills Group: report to the Creative Industries Council.'
606. Although admittedly, the majority of these are so far believed to be in the hands of hobbyists rather than young people. See: http://www.tomshardware.com/news/Raspberry-Pi-Sales-Premier-Farnell,20479.html (last accessed 11 April 2013).
607. See: http://www.teachfirst.org.uk/TFNews/GoogleChairmanannouncesnewpartnershipwithTeachFirst34822.aspx (last accessed 11 April 2013).
608. Seely Brown, J. and Thomas, D. (2011) 'A New Culture of Learning.' CreateSpace as an example.
609. See: http://www.creativeskillset.org/article_8971_1.asp (last accessed 11 April 2013).
610. See: http://alacrityfoundation.co.uk/ (last accessed 11 April 2013).
611. See: http://cicskills.creativeskillset.org/cic (last accessed 11 April 2013).
612. See: http://www.examiner.co.uk/news/local-west-yorkshire-news/2012/09/11/huddersfield-s-textile-centre-of-excellence-leads-new-2m-skills-push-in-uk-86081-31810150/ (last accessed 11 April 2013).
613. See: http://www.bbc.co.uk/mediacentre/latestnews/2012/open-channels.html (last accessed 11 April 2013).
614. See: http://www.ukces.org.uk/assets/ukces/docs/employer-ownership/academy-of-music-and-sound.pdf (last accessed 11 April 2013).
615. See: https://www.gov.uk/government/news/6m-creative-industries-and-digital-content-skills-investment-to-boost-growth (last accessed 11 April 2013) and https://www.gov.uk/government/news/budget-2013-boost-for-creative-industries-sector (last accessed 11 April 2013).
616. See: http://www.bbc.co.uk/mediacentre/latestnews/2012/open-channels.html (last accessed 11 April 2013). The BBC Academy has also provided training and mentoring to arts organisations involved in The Space, (a partnership between the BBC and Arts Council England to build digital capacity in the arts). http://thespace.org/ (last accessed 11 April 2013).
617. See: http://www3.open.ac.uk/media/fullstory.aspx?id=24794 (last accessed 11 April 2013).

Nesta...

Nesta

1 Plough Place
London EC4A 1DE

research@nesta.org.uk
www.twitter.com/nesta_uk
www.facebook.com/nesta.uk

www.nesta.org.uk

April 2013

ISBN 978-1-84875-145-3

Front cover: **Lara Croft ©Square Enix Ltd**