



A report by Deloitte

November 2014

The Scale-up
Challenge

The background of the cover is a close-up photograph of dark, textured, layered rock formations. Several bright green fern fronds are growing from the crevices of the rock. Overlaid on the lower half of the image are four concentric white circles. The title "The Scale-up Challenge" is centered within the innermost circle.

Introduction

This report outlines an initial attempt at considering the way in which the 'Scale-up' programme might work to influence outcomes for the UK economy.

The Scale-up programme refers to a holistic package of support to businesses displaying high growth characteristics. Officially, a High Growth Firm (HGF) is an enterprise with average annualised growth in employees or turnover greater than 20% per annum, over a three year period, and with more than 10 employees in the beginning of the observation period. For full details of the proposed programme please see the main report by Sherry Coutu: "The Scale-up report on UK economic growth". The research presented here was commissioned by Sherry Coutu to feed into the above report.

This report is not designed to be a definitive assessment of impact, instead providing an ex-ante rough-order-of-magnitude range of outcomes.

It is designed to stimulate the debate on business support and Scale-up in the UK (and beyond) and encourage further thinking around the major issues detailed in the report and the assumptions underpinning it. Given that the analysis only considers economic benefits and costs, and excludes direct financial costs, it does not constitute a business case for intervention.

As further research is conducted across the academic community, by government departments, and other organisations, and as more public sector information is made 'open' to further analyse the dynamics of the UK business population on a timelier basis, this will allow greater understanding. With greater understanding, the impact of providing support to firms displaying high growth characteristics should become easier to measure and interventions can become more tailored to circumstance.

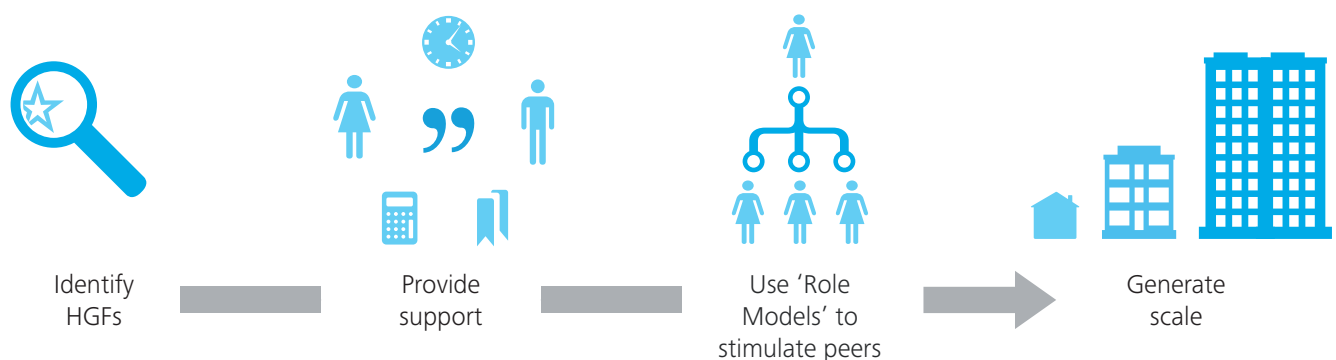
We are grateful for the helpful comments and suggestions of the following individuals who have provided valuable insight to the preparation of this report:

- Albert Bravo-Biosca, Senior Economist, NESTA
- Sherry Coutu CBE
- Mark Hart, Professor of Small Business and Entrepreneurship, Aston Business School
- Thomas Hellmann, Professor of Entrepreneurship and Innovation, Saïd Business School
- Dan Isenberg, Professor of Entrepreneurship Practice, Babson College
- Rhett Morris, Director, Endeavor Insight
- Benoit Reillier, Managing Director, Launchworks Ventures
- Hiram M. Samel, Associate Professor of International Business, Saïd Business School

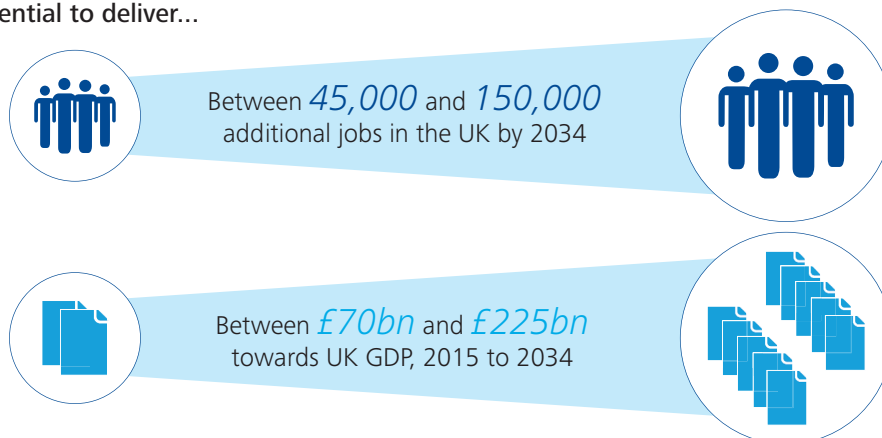
1. Executive summary

The 'Scale-up' programme could generate between £70bn and £225bn for the UK economy in cumulative GDP terms between 2015 and 2034. This level of activity is consistent with an additional 45,000 to 150,000 jobs in the UK in 2034. The key influencers of this impact are the within-firm additionality of intervention, and the extent to which in-firm activity displaces other economic activity across the UK.

Scale-up aims to...



Scale-up has the potential to deliver...



Potential for higher growth in UK productivity through competition



Impact across all areas of the UK: not just in London



Knock-on opportunities for firms in the UK supply-chain



Impact across all sectors of the UK economy: not just tech firms



Source: Deloitte Analysis

'Scale-up' is an exciting proposition with significant potential

Our estimates indicate that Scale-up could have a material impact on the UK economy if it demonstrates the type and level of 'additionality' seen in other, albeit smaller-scale, programmes in the UK and overseas. Scale-up might generate between £70bn and £225bn for the UK economy, in cumulative GDP terms at today's prices, between 2015 and 2034. This is consistent with an additional 45,000 to 150,000 net jobs, above baseline in the UK, by 2034.

The extent of this impact, however, is dependent on a range of factors including the health of the UK economy; the motivation of firms and individuals in the UK; their ability to absorb the assistance provided; and the quality of the interventions themselves. The wide range presented here is necessary: reflecting a lack of evidence on the economic impacts of specific support to HGFs. Nonetheless, the analysis provides an indication as to the scale of the opportunity, if assumptions hold.

Considering what might happen in the absence of Scale-up intervention is critical in arriving at these estimates. A what-happens-anyway 'counterfactual' allows the estimation of the 'net' impact by considering 'additional' impacts within each firm as well as effects on the rest of the UK economy. On this latter point, the reality is that successful HGFs will cannibalise some proportion of activity elsewhere in the UK economy – this is a natural outcome of competition and growth.

Within an organisation the analysis controls for 'deadweight' – or what might have happened anyway in the absence of intervention. This is especially relevant for targeted interventions for existing HGFs, many of whom 'self-select'. Self-selection means that high-performers and firms with potential will step forward to gain additional support. They are equipped to provide some level of growth in the economy without assistance. Of interest here is the extent to which Scale-up support might allow firms to grow at rates above and beyond those happening anyway.

The 'creation' of additional HGFs and economic activity through "Role Model" effects is important. It is understood that a significant number of firms in the UK do not want to scale up until they see their peers scaling-up – "How do I know what I want until I see it?". Recent evidence suggests *this is a significant driver of impact in entrepreneurial ecosystem interventions. Success creates a virtuous cycle, with cause and effect becoming difficult to determine.

Scale-up might generate between £70bn and £225bn for the UK economy, in cumulative GDP terms at today's prices, between 2015 and 2034

Beyond suggesting that intervention will induce more firms to become HGFs through peer-related effects, it is difficult to estimate the number of HGFs likely to be 'created' in this way.

In considering the impact of existing and new HGFs on the wider economy, it is necessary to make adjustments for 'displacement'. Displacement here refers to the cannibalisation or destruction of activity elsewhere in the economy, either in product or labour markets. Research shows that for economies with a high proportion of HGFs, there is often an equivalent (if not identically sized) population of firms who are contracting, shedding jobs, and in time 'dying' or being acquired. This is consistent with the notion of increased competition – whereby new innovative firms replace older firms in a constant cycle of replacement to allocate resources more efficiently.

A corollary of increased competition is that **productivity** levels should, in theory, increase as inefficient firms shrink or go out of business: competition leads to a reallocation of resources toward the most productive firms in the economy. Evidence is still mixed on the precise productivity effects of HGFs, which tend to depend on whether HGFs are defined on turnover or employment – the latter can be associated with lower productivity in the short-term.

As HGFs interact positively with organisations around them in the supply-chain, they will stimulate the production of goods and services that are required as inputs to their own business, '**indirect**' impacts; produce goods and services of greater value to their clients; and collaborate with other organisations to create agglomeration economies and associated effects.

We choose not to include productivity uplift estimates in our core analysis. Instead, we refer to timely research conducted on behalf of NESTA into allocative efficiency, which shows that the 'size-of-the-prize' for the UK is significant. The upshot is that if HGFs can drive improved productivity outcomes for the UK, the impact of intervention would be higher still.

2. Scale-up: the evidence

This chapter shows that whilst there is evidence that targeting interventions on HGFs delivers positive impacts for the economy, the evidence-base is not complete. Nonetheless, there is an emerging consensus of opinion in the UK across academia, business and government that targeting High Growth Firms is a worthy intervention.

2.1 Making the case for intervention: market failure

The case for intervention in business support, and across the dimensions identified in the Scale-up programme, are well documented. The Department for Business Innovation and Skills (BIS) has identified 3 enablers of business success and the associated market failures that inhibit firms from reaching their potential.¹ The three enablers are:

- Internal capacity and capability;
- External environment; and
- Vision of the business owner.

Specific market failures necessitating government intervention in business support are known to include, inter alia:

- A lack of information (where firms are unaware of the suite of support options open to them);
- Informational asymmetry in accessing finance (affecting businesses with little collateral and/or track record and leading to a lack of demand for finance either due to rejection or the fear of rejection). This is arguably the sign of a rational market in operation;
- Co-ordination failure (where provision of support to business as a public good is not provided holistically across the stakeholder environment);
- Institutional deficiencies;
- Externalities (including the positive spillovers from the success of individual firms on the economy and wider society); and
- The business cycle exacerbating these issues (recognising the economy as a whole cannot be managed).

More broadly, and certainly not the result of a single or non-complex market failure, government acknowledges the need to address the issue of the UK's productivity performance. This has been poor in relation to historical trends, as well as against comparable international benchmarks.

Between 1980 and 2007, ONS data indicates constant price productivity per job (GVA terms) in the UK increased by an average of 2.4 per cent each year. Over the period 2000 to 2007, productivity per job rose by a healthy (if below-trend) 1.9 per cent each year. Since then, productivity per job has contracted in 3 years out of 6, with an average reduction per annum over that period of 0.4 per cent. This was initially due to the recession but since then other factors have contributed that are not immediately evident.

As this report goes on to discuss, interventions to assist businesses in the UK, and specifically to allow HGFs to grow yet further, could improve the UK's productivity performance over the coming years. One explanation (amongst many) for the slowing in productivity growth pre-recession (2000 to 2007 relative to the long-term trend) is a reduction in 'allocative efficiency' in the UK: the subject of a new research paper funded by NESTA which is considered in chapter four.

¹ BIS, 2013, Key Enablers of Business Success & the Economic Rationale for Government Intervention.

2.2 Supporting the “right” firms

Historically, intervention has been targeted at SMEs and start-ups without specific regard for high growth characteristics, but this has started to change, and there is growing recognition from stakeholders that the targeting of a select number of High Growth Firms (HGFs) could be a more successful undertaking than focussing on SMEs without regard to growth.

As a useful analogy, Professor Dan Isenberg of Babson College has noted that it is a much longer, complex and arduous process for society to nurture and raise a single child into a successful human being, than to encourage an additional child into the world.² The same holds for a successful business.

Mariana Mazzucato of the University of Sussex, states:³

“The focus on entrepreneurial ecosystems is symptomatic of the misplaced obsession with SMEs and Start-ups in terms of their ability to generate innovation and growth. What I believe should be emphasised is not Start-ups or entrepreneurs in and of themselves, but the innovation ecosystems within which they operate and which they depend on if they are to become what does matter: high-growth innovative firms (of any size) within that system.”

Introducing High Growth Firms (HGFs), the OECD Definition

High-growth enterprises, as measured by employment (or by turnover), are enterprises with average annualised growth in employees (or in turnover) greater than 20% a year, over a three-year period, and with ten or more employees at the beginning of the observation period.

Regardless of precise definition, it is clear that a small proportion of the UK business population is high growth in nature, and, that these HGFs generate a much more significant proportion of employment growth and output growth than their share, by number, would suggest.

OECD research shows that, whilst there is a large degree of heterogeneity in business dynamism across countries, but in general terms:

- Young firms tend to create more jobs than older firms;
- The primary sources of job creation in an economy are those generated by the entry of new start-ups and the growth of ‘young survivors’ – e.g. High Growth Firms;

With respect to HGFs in the UK, recent research from Mark Hart of the Enterprise Research Centre and Aston Business School shows that their contribution to the UK economy has fallen in recent years, both absolutely, and in relative terms.⁴

“In brief, over the most recent 2010-13 period, HGFs (as defined by the OECD) accounted for about 1% of all job creating firms but 18% of the jobs created by job creating firms. In absolute terms the 10,172 HGFs added 839,352 jobs between 2010 and 2013 of the 4.6 million added between the same years by all job creating firms – in the periods up to 2005-08 the comparable HGF figure was more than one million. Although HGFs continue to make a significant contribution to job creation over a three year period, HGFs do appear to have become less important.”

Examining previous cohorts in more detail there has been an apparent reduction in the level of employment generation by each firm on a per firm basis.

- The 2002-2005 cohort produced an average of 167 net jobs per HGF in the UK between 2002 and 2005.⁵
- The 2005-2008 cohort produced an average of 110 net jobs per HGF in the UK between 2005 and 2008.⁶
- The 2010-2013 cohort produced an average of 83 net jobs per HGF in the UK between 2010 and 2013.⁷

Some of this reduction in job generation could be due to the recession although the downward trend seems to have been well underway prior to 2009 when the recession took hold in the UK. There are a number of interrelated factors at work here though, including a growing trend toward smaller-sized firms across the UK: the ‘micropreneurs’ detailed in a recent thought piece by RSA.⁸



- 2 Dan Isenberg, 2012, Focus Entrepreneurship Policy on Scale-Up, Not Start-Up, Harvard Business Review Blog <http://blogs.hbr.org/2012/11/focus-entrepreneurship-policy/>
- 3 Mariana Mazzucato, 2014, Start-up myths and obsessions, Economist: By Invitation special report
- 4 Mark Hart, 2014, Firm Dynamics and Job Creation in the UK:1998-2013, International Small Business Journal (Publication Pending)
- 5 Anyadike-Danes, Bonner, Hart and Mason, 2009, Measuring Business Growth: High-growth firms and their contribution to employment in the UK, NESTA
- 6 Anyadike-Danes et al, 2009, Ibid.
- 7 Mark Hart, 2014, Ibid.
- 8 RSA, 2014, Growing Pains.

The above estimates show the level of net jobs created within HGFs, but this level of job creation will not translate directly to the level of growth Scale-up intervention creates in each HGF or across the UK economy as a whole.

As subsequent sections of the report go on to detail, some firms will grow to a great extent anyway, such that only a proportion of growth in HGFs can be attributed to intervention. Moreover, there is evidence detailing the extent to which HGFs displace activity in the wider economy as a result of competition (sometimes referred to as creative destruction – a Schumpeterian concept).⁹

Whilst the evidence shows that HGFs contributed fewer jobs to the UK economy than they did a decade before, the scale of their contribution relative to other firms remains many times more than proportionate, and there is latent potential for HGFs to contribute to a greater extent in future.

Other research suggests that as well as the growth characteristics of a firm (i.e. HGF status), the age of the firm is an important determinant of economic growth. Haltiwanger et al have used data from the US (which may not translate directly to the UK) to consider the effects of firm size and age on employment growth.¹⁰ The research supports the idea that the scaling of younger firms generates economic value through net job creation with weaker evidence of impact amongst older firms. The research also indicates that it is new firms, rather than small firms (of any size), that drive growth. The authors are careful to note that the analysis focuses on the measurement of impact, rather than the effect of policy, but taken together with other research this suggests that relatively new, fast growing firms are the drivers of economic growth and should be supported to a greater extent than they currently are.

Two particular issues specific to measuring the contribution of HGFs and the impact of supporting them – productivity and displacement are discussed in greater detail in chapter three.

A third issue raised during the course of the research is the risk of supporting ‘losers’, or HGFs who don’t create additional value. This is a natural feature of business support, and by assisting a broad portfolio of HGFs across a range of sectors and locations, the effects can be minimised.

2.3 A lack of evidence on impact?

It is generally accepted in the UK that:

- HGFs deliver a disproportionate amount of economic growth given their share of the economy;
- Business support can solve market failure and, with it, improve economic outcomes; and
- More effective targeting and provision of business support is required.

It is also widely accepted that there is no ‘silver bullet’ solution to business support. The evidence required to ‘prove’ specific impacts accruing from a programme such as Scale-up will occur, does not exist in its current form, and it is not likely to exist anytime soon.¹¹

BIS research alludes to the paucity of evidence on causal links in measuring the impact of business support programmes, and Roper and Hart note:¹²

“Two particular issues arise in the evaluation of support for sustained growth. First, in the majority of the schemes considered ... there is a strong selection element, the aim being to focus attention on those firms with the strongest growth potential. Any evaluation of the effectiveness of the scheme itself needs to control for this selection element in the process to be able to isolate the value of the scheme itself. This is not straightforward particularly given the likely difficulty of identifying a matched control group.”¹³ Second, even if selection could be effectively controlled for, the schemes we profile are complex and often offer either holistic support or at least provide a combination of support measures. Which of these elements of the scheme is actually providing most benefit to the firm? This is unlikely to be testable in any ex post quantitative approach.”

And, as a result of this:

“The majority of the programmes profiled here are relatively new – introduced often in the 2009-11 period. At this point, due primarily to the need to wait some time before impacts are identified, rigorous evaluation evidence on the effectiveness of most of the measures is lacking. Indicative evidence referred to in the brief scheme profiles is almost always positive, however, with take-up generally high.”

⁹ The Economist’s Economics A to Z states: Schumpeter wrote the ‘Theory of Economic Development’. In this he set out his theory of entrepreneurship, in which growth occurred, usually in spurts, because competition and declining profit inspired entrepreneurs to innovate. This developed into a theory of the trade cycle (business cycle), and into a notion of dynamic competition characterised by his phrase ‘creative destruction’.

¹⁰ Haltiwanger, Jarmin, and Miranda, 2013, Who Creates Jobs? Small vs. Large vs. Young The Review of Economics and Statistics Volume XCV, Number 2.

¹¹ We note that at the time of writing BIS is in the process of procuring research to understand the productivity contributions and macro-displacement effects of interventions.

¹² Hart and Roper, 2013, Supporting sustained growth among SMEs – Policy models and guidelines, ERC White Paper No. 7

¹³ Whilst self-selection makes evaluation and impact measurement a difficult proposition, it is usually an explicit aim of intervention in terms of scale up – i.e. to take those with potential and make them achieve it. Firms will decide to participate based upon whether they expect the benefits from participation outweigh the costs.

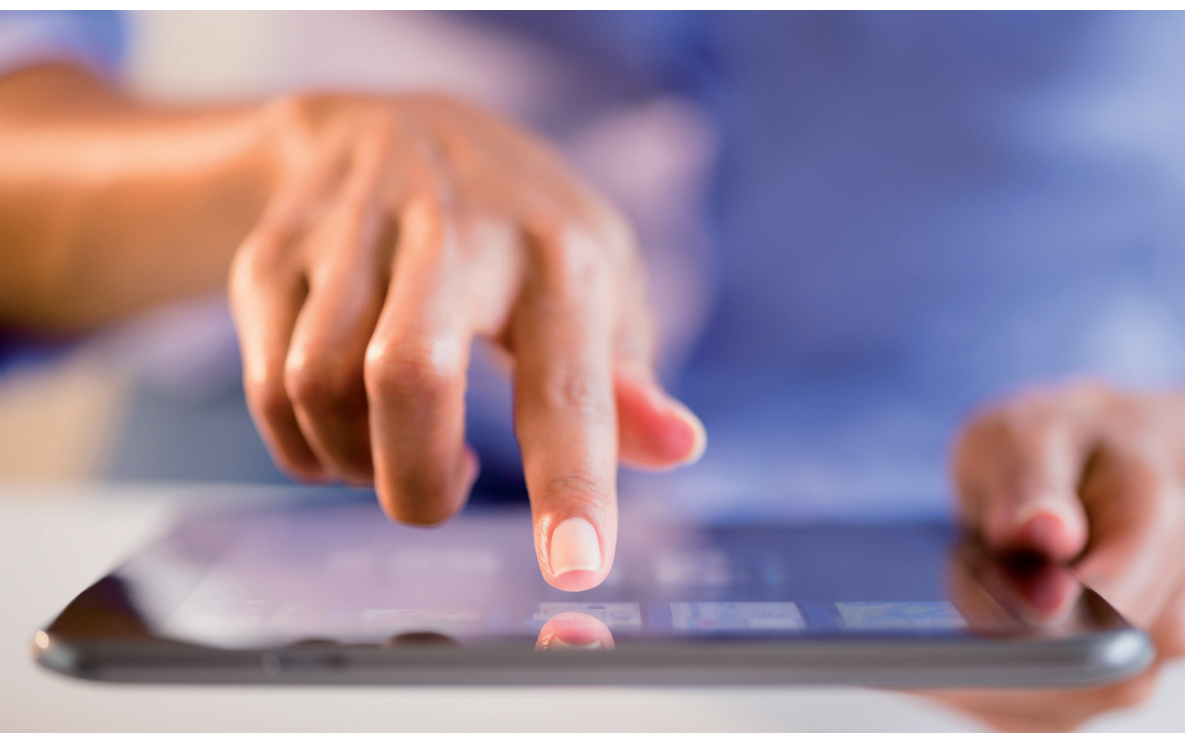
Further, a consultee noted that measurement is “nigh on impossible” due to:

- Local impacts;
- Sectoral impacts; and
- The biggest issue in entrepreneurial ecosystem intervention: “success, when it is out of control, poses a measurement challenge.” That is to say, it either goes unnoticed, or, can be measured, but it is by then impossible to distinguish between cause and effect.¹⁴

There have nonetheless been a number of attempts made (including this one) at considering the aggregate impacts of assisting specific types of businesses in the UK. The most publicised of these is the work conducted by the Confederation of British Industry (CBI) in 2011, which included an assesment of fast-growing businesses or ‘Gazelles’.¹⁵

The research stated that Gazelles create the vast majority of new jobs in the UK and suggests that if the UK can recreate the conditions that have seen Medium-sized Businesses (MSBs) flourish in other countries, between 2012 and 2020, these firms could add an additional £20-50billion in output to the UK economy. On an annual basis these impacts are in reasonable keeping with the magnitude of impact discussed in chapter four.

Having considered the available statistics and published evidence, and having spoken with representatives from Government and Academia, it was agreed that the optimal method to outline order-of-magnitude contributions of Scale-up should be simple and based upon a “stock-flow” model rather than being econometric in nature.



14 Covered in Schumpeter, (1932, published 2005), Development, Journal of Economic Literature Vol. XLIII. This essentially states that “novelty”/ step changes in productivity cannot be predicted, and thus that economic development cannot be predicted. As an example, increasing population drives the demand for mailcoaches, which leads to many mailcoaches, before we observe trains being invented. Regardless of the peak number of mailcoaches in existence, they did not cause the invention of trains. Both a derived demand from the same source, but a different means of achieving the same end. The invention of the train is novel, a step-change, enhances productivity, which could not have been achieved in easy incremental steps from mailcoaches and could not have been predicted.

15 Confederation of British Industry, 2011, Future Champions: Unlocking growth in the UK’s medium sized businesses. However, Research by Mason and Brown on Gazelles shows that Gazelles are not young and that growth is sporadic.

The interventions will take place across all sectors of the UK economy, all regions of the UK and will not depend on the age of a company – young or old firms can benefit, if they are growing.

2.4 Proposed Scale-up interventions

As the main Scale-up report outlines, interventions are not about ‘throwing the baby out with the bathwater’. The interventions put forward are instead about greater co-ordination and collaboration, data-sharing, the tweaking of existing policy and identifying companies more judiciously across a holistic suite of interventions. This is not a request for significant levels of additional funding from government. Scale-up is about modifying existing initiatives and redirecting resources to those who need it most and will generate the most benefit.¹⁶

As Hart notes:

“... sustained growth is likely to require a holistic rather than thematic support model, with a dual focus on the development of the business and the capabilities of the entrepreneur”

More detail on the specific interventions put forward for Scale-up can be found in the main Scale-up report, but they broadly cover the following themes:

- Holistic coordination across public, private and third-sectors, covering;
 - Talent;
 - Mentoring;
 - Market stimulation;
 - Access to finance;
 - Infrastructure; and
 - Culture.

In our view, these align with the **necessary** conditions for growth, but **in isolation** each theme is likely to be an **insufficient** condition to generate economic growth through HGFs. It is not feasible to ascribe benefits to each of these seven intervention strands, but there is some consensus that holistic co-ordination, talent and (face-to-face) mentoring are likely to be the three most important drivers of success in the long-term.

Local intervention as a primary driver of impact

We do not consider the specific regional or local effects of Scale-up in a modelling context here, but a key feature of HGFs is that they are all different – in terms of age, size, location and other factors. Accordingly, the interventions will take place across all sectors of the UK economy, all regions of the UK and will not depend on the age of a company – young or old firms can benefit, if they are growing. Selected evidence on the sectoral make-up of HGFs is provided in chapter four.

As noted by Isenberg, peer-group impacts and specific local/sectoral effects mean that there must be a local focus. This is not an aggregate national level initiative and must be delivered locally.

To illustrate the distribution of HGFs spatially in the UK, the chart overleaf shows the number of HGFs in each Local Enterprise Partnership (LEP) in England, as well as the number of HGFs per 1,000 people in the same areas. This latter measure is shown relative to the all-England average so that to the right of the Y-axis there are more HGFs per 1,000 people in the area than the national average.

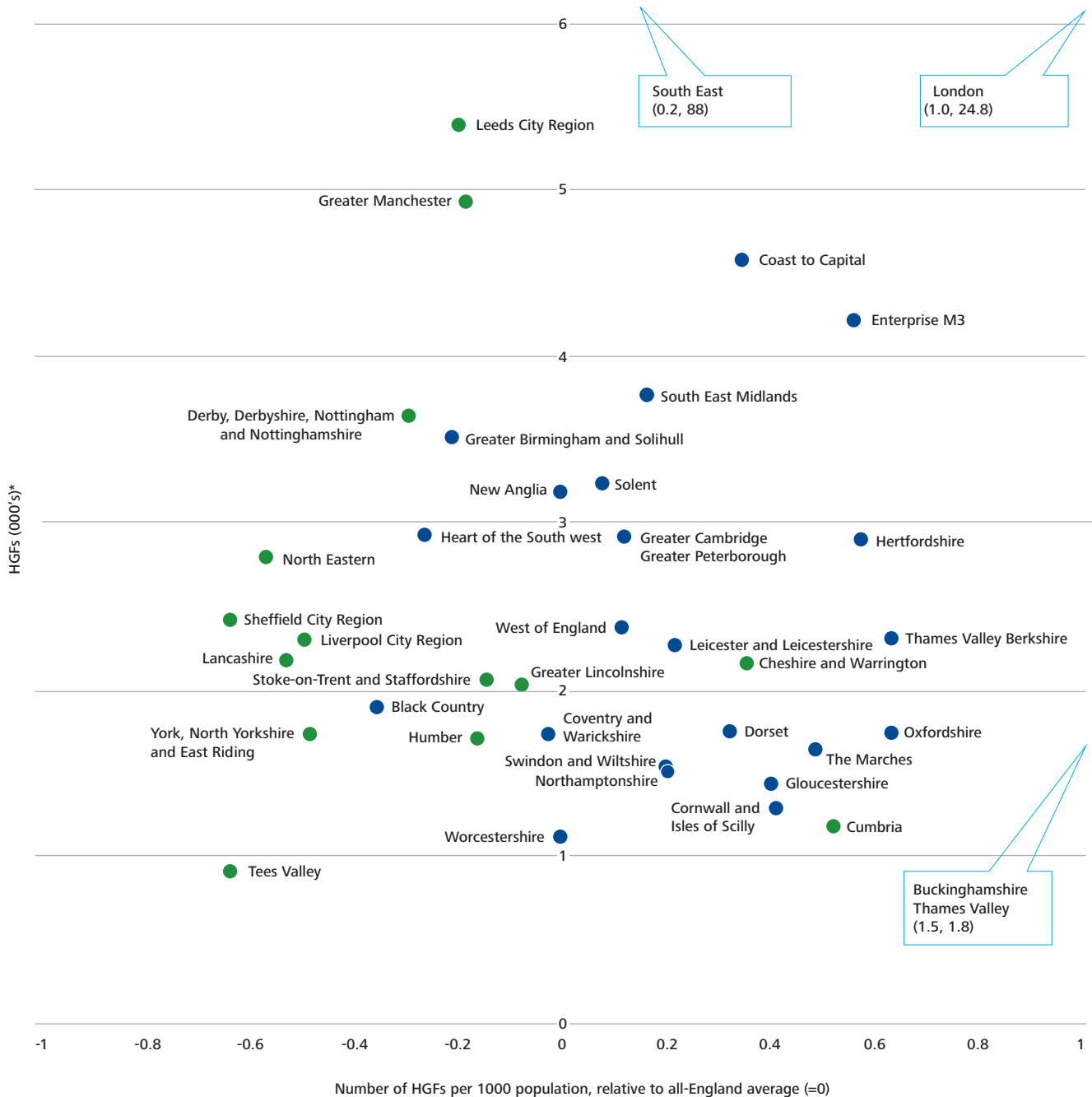
HGFs here are defined as those growing at over 20 per cent between 2010 and 2013, inclusive of those firms with fewer than 10 employees. These smaller organisations are not included in our analysis elsewhere in the report, but the inclusion of these smaller firms is not likely to detract from the key features evident in the chart, which are:

- There is a concentration of HGFs in London and its environs, as expected given London’s scale and economic contribution to the UK;
- There are also concentrations in most of the major urban conurbations in England. Showing that HGFs aren’t just a ‘London Thing’; and
- Whilst the absolute number of HGFs seems to be related (although not exclusively) to the degree of urban concentration, ‘Northern’ LEPs (green and defined as north of Birmingham and Leicester) seem to have less representation per head of population than ‘Southern’ LEPs (blue) – only Cumbria and Cheshire and Warrington appear to the right of the Y-axis.

This suggests that Scale-up might be used as a policy

¹⁶ We have made no attempt during the course of this research to consider the gross or net costs to Government of the Scale-up programme, and all benefits discussed in the report are economic.

Figure 2.4.a. Local HGF incidence: Number of HGFs per LEP and HGFs per 1,000 population, 2010-13



Source: Deloitte Analysis, Mark Hart, ONS. HGFs are UK-owned units with 1-249 employees, born <2010, survived 2010-13

tool to improve economic outcomes in the North of England. The reasons for the variation in incidence across these areas, or to give an indication of how Scale-up impact might vary by local area, is beyond the remit of the study.

Previous research for NESTA has considered how the incidence of HGFs has changed over time across the whole of the UK, based on the HGF share of the business population. This identifies those authorities (380 in total) which have consistently under/over-performed relative to expectations given their characteristics. This analysis also shows that London performs better than elsewhere, that urban areas in the North perform well in absolute terms, and that some areas underperform relative to expectations – notably Birmingham.¹⁷

The trick is in understanding why this happens and what to do about it in the form of specific Scale-up interventions in local areas. It is a good example of how better and more-timely public sector information on HGFs might help in formulating policy interventions at a national and local level, and sits well with the broader devolution agenda. This could drive real impact through Scale-up and many other initiatives, and contribute to tackling both the ‘North-South Divide’ and the UK productivity puzzle in the longer-term.

What differentiates Scale-up from existing interventions and programmes?

1. Convening local stakeholders to push and facilitate local intervention impacts.

2. Scale-up is about a more co-ordinated blend of policy and interventions by public, private and third-sectors to target market failures across both demand and supply, including:¹⁸

a. **Skills** – without tackling the skills issue, there is likely to be a real limit to long-run potential arising from increased demand for Scale-up products and services – our subsequent analysis assumes a flexible labour market which adjusts to demand and this is far from guaranteed;

b. **Mentoring** – discussions during the research yielded a common theme: namely that ‘face time’ is a major determinant of success in growing firms. There is no substitute for the right support, in-the-flesh, from the right people; and

c. **Market stimulation and procurement** – providing government support to Scale-ups ensuring the widest possible benefit through, for example, export support and Government procurement.

3. Getting and using the right data and evidence is of paramount importance and a core requirement of the proposals for Scale-up. It presents a perfect opportunity to use Public Sector Information (PSI) for evidence-led and cost effective policy-making, and, in time, monitoring and evaluation to provide evidence that policy is working:

a. **Driving improvements in evidence based policy-making** – more data made available and better use of it by policy-makers, businesses and investors, is likely to have significant positive effects on the UK economy. For further details see Deloitte’s input into the Shakespeare Review of Public Sector Information;¹⁹

b. **Pushing for the triangulation of disparate PSI sources** – linking business units, individuals and statistics across a range of surveys and real-time data (HMRC PAYE, Export data, Companies House) per the Nordic trend, to allow the right support to be provided to potential beneficiaries – this will also benefit wider policy making beyond Scale-up as others leverage improved data. This requires information on the businesses themselves, both specifically and in aggregate; and

c. **More timely interventions** – The “Global race” is not a zero-sum game given the benefits accruing from trade, but with international competitive dynamics and pressures there is potentially a first-mover advantage for UK firms and, by association, policy-makers if the UK provides the right support from the right data before other policy-makers overseas do the same. On the flipside, not using timely data to determine policy could lead to a last-mover disadvantage if the UK lags the field internationally on HGF support, and other policy areas.

More targeted, evidenced-based support to the right firms, based upon timely data could yield better Value for Money (VfM) for Government than the same policies enacted with a lower calibre ‘information set’. We recognise that the challenges associated with linking and publishing data are non-trivial, but finding a way to overcome these problems is a priority.

¹⁷ Anyadike-Danes, Bonner, and Hart, 2013, Exploring the incidence and spatial distribution of high growth firms in the UK and their contribution to job creation, Nesta Working Paper 13/05.

¹⁸ Stakeholders indicated that these are the most important drivers of success, but it is also noted that binding constraints theory may not apply here. In other words, the complexity of the ‘system’ – i.e. the economy – may mean that these three conditions are necessary, but not sufficient, for impact.

¹⁹ Deloitte, 2013, Market Assessment of Public Sector Information. On behalf of Stephan Shakespeare and BIS.

2.5 The transmission mechanism – Scale-up and long-term economic growth

By creating jobs, and driving productivity growth, HGFs can generate increases in GVA. The impact HGFs have on the economy can be measured in terms of:

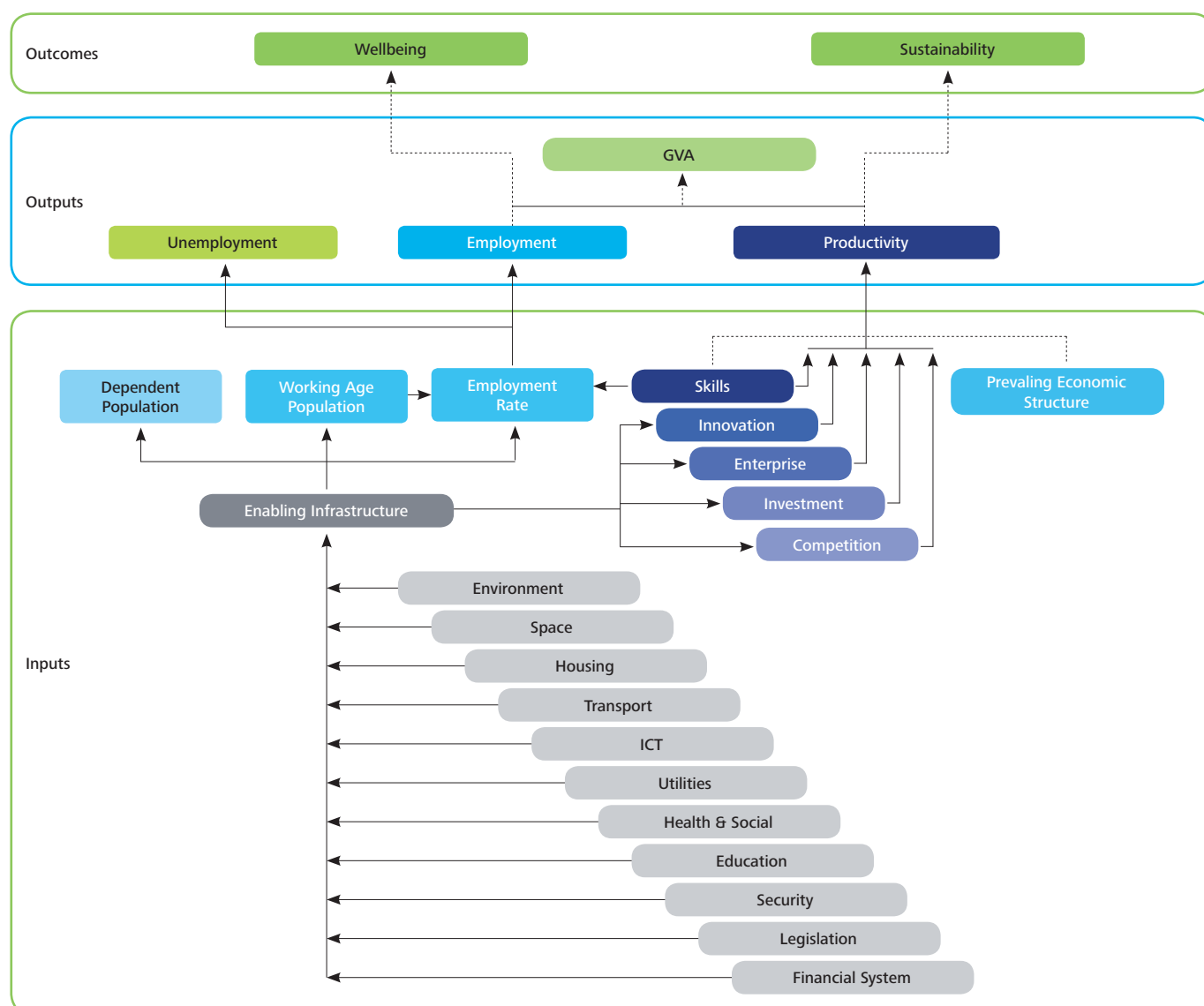
- Gross output (analogous to firm turnover), including export revenue;
- Jobs;
- Productivity (GVA) per job (as well as metrics such as Total Factor Productivity); and

- Gross Value Added (analogous to GDP), which includes:

- Wages;
- Profit; and
- Attributable taxes.

Deloitte's Long-term Economic Growth Framework (below) illustrates how levels of employment and productivity together determine GVA, and also how employment and productivity are in-turn determined by the UK's enabling infrastructure and the '5 Drivers of Productivity'.

Figure 2.5.a. Deloitte's Long-term Economic Growth Framework



Source: Deloitte Analysis

Higher rates of productivity in HGFs are dependent on '5 drivers'. Scale-up should:

- improve skills levels so that HGFs and employees share in the benefit;
- provide a platform for enterprise by encouraging more HGFs to develop;
- foster innovation in products, processes, and other areas within HGFs;
- encourage investment in HGFs to underpin growth; and
- breed greater levels of competition to ensure the more efficient allocation of resources.

By extension, if conditions are not right to facilitate the growth of HGFs, there could be a supply-side drag on the economy's growth potential, and the benefits outlined in the chapter four are less likely to come to fruition. Equally, the necessary enabling infrastructure has to be in place, and optimised, to allow the education system, financial system and relevant legislation to support HGFs and stakeholders in the right way. An example of this is the release of public sector information to policy-makers and stakeholders to allow more effective targeting of support.

2.6 A framework for estimating the impact of Scale-up on HGFs and the economy

The study framework, overleaf, provides an illustration of the 'net' economic contribution of Scale-up. The 'net' impact of intervention is the outcome where Scale-up support is provided, less the baseline – the 'as you were' at both macro and micro level. Suppose in the baseline that there are:

- **Can't Scale Won't Scales** – firms of any size, but many micro-firms, who have no interest in growing (at least yet);
- **Want Scale Can't Scales** – firms who would like to grow but don't have the ability, knowledge and/or support to do so;
- **Natural Successes** – essentially those who are, or will go on to be HGFs regardless of whether Scale-up support is provide or not. This represents the 'self-selection' effect.

Now suppose that Scale-up support is provided and it delivers desired outcomes. To isolate the effects of Scale-up ex-post requires the measurement of gross outcomes and the removal of the baseline as a 'counterfactual' case. Ex-ante, it is helpful to consider where intervention is targeted and whether the impacts of the Scale-up programme are likely to be additional.

As the framework shows, we are not interested (yet – ambition and peering are discussed below) in firms that can't scale and won't scale. BIS estimates show that in 2013, there were over 1.5m SMEs in the UK who were not growing and had no wish to grow.²⁰ The same analysis showed that almost 2.7m SMEs in the UK wished to grow but were not growing (growth defined as > 5 per cent in employment or turnover terms), and just 640,000 SME firms were growing on this measure.

In other words, there is a significant amount of inertia in the UK system, where growth is desired, and that might be targeted by Scale-up. Notwithstanding the fact that the definition of HGFs used in the subsequent analysis is the OECD definition (which differs from the above), Scale-up might be expected to remove barriers to growth and in doing so:

- Have **zero effect** on the **Can't Scale Won't Scales** (at least in the short-term);
- Allow a significant number of **Want Scale Can't Scales** (existing or yet to be born) *who otherwise would not have become HGFs*, to become HGFs and generate additional economic growth – these are the **Scale-ups supported**; and
- Provide **Natural Successes** with access to augmented Scale-up support and in doing so *allow these firms to be better HGFs than they otherwise would have been*, delivering greater economic growth for the UK.

This is not the whole picture, however. In supporting HGFs and then promoting the success of the same HGFs, there is a potentially significant secondary impact over time, noted in particular by Dan Isenberg: The "**Role Model Effect**". At an individual firm level, this equates to "I did not want to scale, until I saw others scale, and now I do". Ambition is ignited by the behaviour of peers.

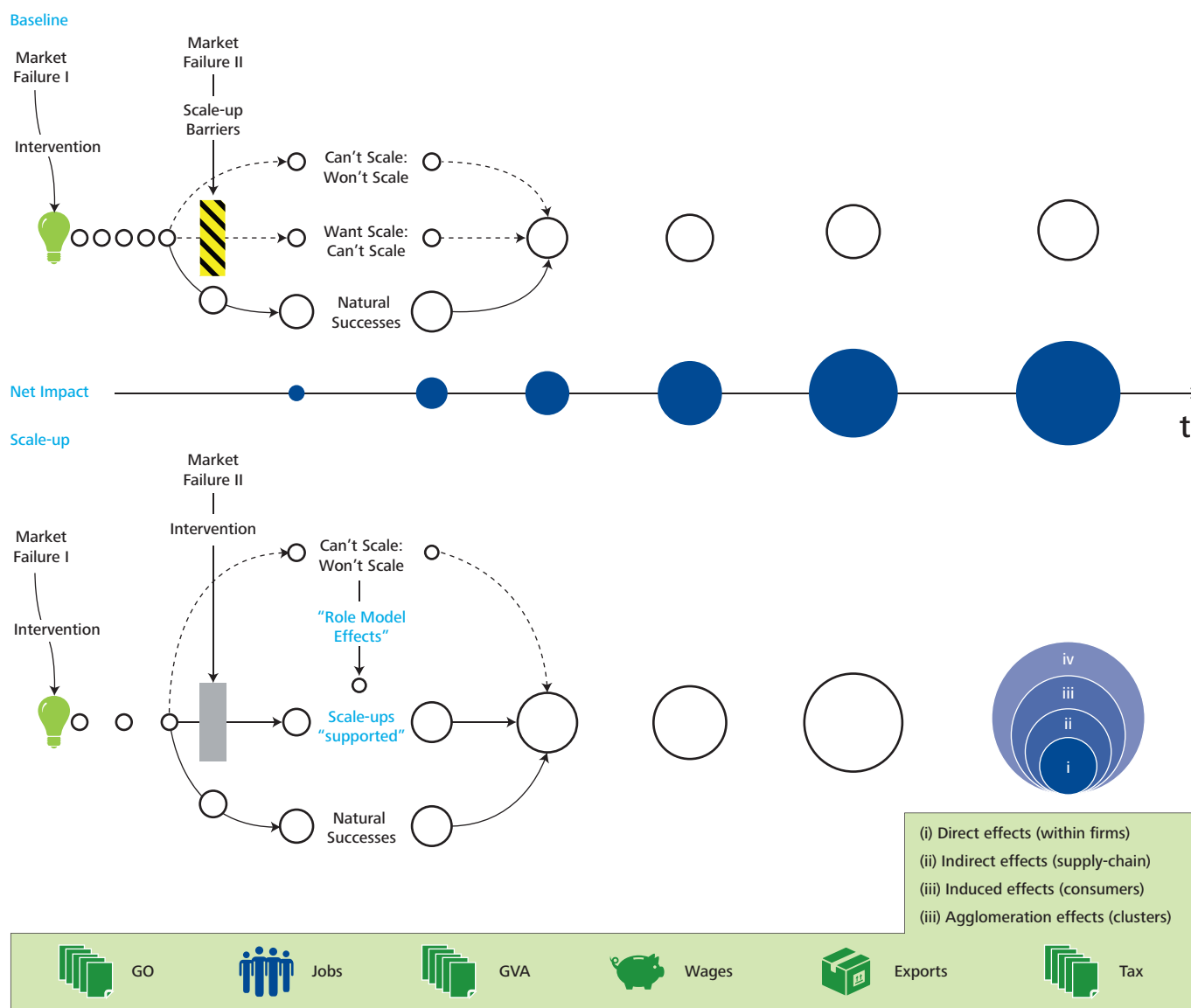
Isenberg states that the biggest impact of an entrepreneurship ecosystem intervention, which is already evident in Manizales-Mas, Colombia after only 2 years, is on the “didn’t want to scale until I see others like me scaling.” In other words, “how do I know what I want until I see what it is and realise that it is feasible?”.

With regard to the 1.5m SMEs in the UK with no wish to grow, Isenberg has seen first-hand evidence of the Role Model effect. His take, is that that some proportion of these SMEs in the UK would be induced to change their aspiration levels if HGFs were more visible and celebrated.

There is a note of caution, however. Namely that these effects would only happen locally amongst peers, because, by their nature, these effects are likely to be driven very locally.

Even if only a tiny proportion of the 1.5m SMEs could be encouraged to think differently, develop greater ambition, and Scale-up, the number of HGFs in the UK could be increased significantly from a relatively low base.

Figure 2.6.a. Scale-up Study Framework



Source: Deloitte Analysis

3. Estimating the impact of Scale-up

This chapter provides a discussion of the method used in the study to provide estimates of the economic effects of intervention, as well as the data/research sources consulted that underpin the analysis.

3.1 Method and data

The overarching method

The analysis is built around a set of baseline estimates for the UK economy over the next 20 years to 2034. The main variables in the stock-flow model are:

- Employment (total workforce jobs);
- Real GDP (in 2014 prices);
- Productivity per job (in 2014 prices); and
- UK Business counts, including:
 - All private sector businesses;
 - All employee-only private sector businesses;
 - All employee-only private sector business with > 10 employees; and
 - All UK private sector HGFs (per the official OECD definition).

Baseline forecasts of employment, GDP and productivity from Oxford Economics are complemented with trend extrapolations of relevant business counts, to provide a stock of businesses by type to 2034. The justification for simple extrapolations is the apparent lack of a causal relationship between changes in the stock of businesses in the UK and economic growth (or vice versa).²¹

To then consider how Scale-up intervention might influence HGFs and lead to improved economic outcomes for the UK, a number of scenarios have been developed. The specifics for each of these scenarios are detailed subsequently, but the premise is that intervention leads to an uplift, relative to baseline, in:

- The number of HGFs in the UK – through enhanced data provision, better-use of data and Role Model effects;
- Turnover growth within HGFs – intervention turnover growth premia (after accounting for deadweight loss – what would have happened anyway);

- The employment base of HGFs;
- The net economic contribution of HGFs (after accounting for displacement/destruction);
- The further economic contribution of firms supplying HGFs (Type I effects).

The main drivers of impact in the model for any given scenario are:

- the number of additional HGFs in the UK as a result of Scale-up intervention and peer-group effects;
- the additional uplift in turnover deemed attributable to intervention within firms based upon recent evidence;
- the additionality or ‘destruction’ adjustment to exclude the non-additional impact outside HGFs, where otherwise existing activity in the rest of the economy is displaced; and
- the additional activity generated in the supply chain from an increase in HGF specific activity.²²

Key data sources and evidence

The following data sources have been used to populate the stock-flow model and provide for the main assumptions in the model:

- Baseline economic information for the period 1981 to 2034, pertaining to employment, GDP and per worker productivity has been sourced from Deloitte’s subscription to Oxford Economics UK economic forecasts (updated 28 July 2014).
- Time series business count estimates for the UK have been sourced from BIS’ Business Population Estimates for the UK and the Regions, 2013. These run from 2000 to 2013 and are based on counts as at 1st January in a given year.

21 For specific data please refer to the rest of this chapter and Annex 1 for time series data.

22 Some commentators noted that consumer spending effects, and agglomeration effects should also be included in the analysis to augment these supply chain effects. We have omitted these on the grounds that they are not typically included in standard appraisal within Government based on the Green Book.

- Time series estimates of the prevalence of HGFs in the UK between 2001 and 2013 have been sourced from Mark Hart's forthcoming paper "Firm Dynamics and Job Creation in the UK: 1998-2013". These estimates pertain to the three-year period up to and including the end year as a result of the definition used, but for practical terms the end year is taken as the input to our model in the associated year.
- Average turnover per HGF is based on a combination of estimates of turnover per business and turnover per employee from BIS' Business Population Estimates for the UK and the Regions, 2013, coupled with sizeband estimates of the HGF population in UK from the Enterprise Research Council.
- Intervention turnover growth premia are based upon estimates of impact from the Goldman Sachs 10,000 programme in the UK, and the Endeavor programme in 20 emerging economies. As published, these estimates are not adjusted to reflect the impact of the programmes themselves on the wider economy. Please see the next section of the report for a further discussion.²³
- Estimates of the proportion of Gross Output (turnover) that constitutes Value Added (and by association GDP contribution) are taken from ONS' Input-Output Analyses Domestic Use Matrix.
- The 'destruction adjustment' is based upon data pertaining to jobs destroyed and jobs created contained within the Firm Dynamics Growth Database kindly provided by Albert Bravo-Biosca of NESTA. More detail on this estimate is provided subsequently.

The assumption with no specific underlying evidence is the number of HGFs policy intervention can 'create'. Better identification through data and the "Role Model" effects mentioned earlier, means we expect more HGFs in the policy-on case than the baseline case. Additional HGFs are assumed to number 80 per annum (c. 0.75% of the current population in 2014). This means 1,600 additional HGFs above baseline over the 20 year study horizon.

With regard to "Role Model" effects, it is posited that a significant number of firms will not want to scale-up until they see their peers scaling-up – "How do I know what I want until I see it?" Recent evidence from Colombia suggests that this is a significant driver of overall impact. Intervention and growth create a virtuous cycle, and at that point cause and effect are practically impossible to determine.

So beyond indicating that intervention might induce more firms to become HGFs, and with it increase the number of HGFs in the UK, it is not possible to put a precise estimate on the number of HGFs created in this way.

We are comfortable that 80 new, additional, HGFs per annum from a mix of better identification and role model effects are feasible in the context of the Scale-up programme, but accept that this cannot be substantiated with existing evidence.

A practical way of estimating additionality

To estimate economic impact, the analysis has to account for additionality. Observed estimates for the average firm are gross impacts at micro level and these do not translate directly to macroeconomic impact.

The first, and most obvious, adjustment required is to ensure that results are presented in terms of Value Added rather than turnover.²⁴ As stated above, we use sectoral estimates from ONS to turn firm turnover into Value Added and thus GDP contribution.

Value Added is an economic measure of output adjusted to account for the specific value created by each firm or sector of production. By definition, firm turnover also includes the 'intermediate consumption' of goods and services produced by others. The value of this intermediate consumption does not constitute Value Added by the firm using the inputs, rather it is Value Added for those who are providing the inputs. By stripping out this intermediate consumption, there is no double counting of impact across the economy. This is the principle underpinning national accounts.

With regard to "Role Model" effects, it is posited that a significant number of firms will not want to scale-up until they see their peers scaling-up.

²³ We recognise that there are different costs associated with difference types of intervention and their intensity, but consideration of costs are not part of the remit of this study.

²⁴ Value Added is composed of operating profit, wages paid to employees and attributable taxes. It thus excludes all intermediate purchases made by the firm or sector in question.



Beyond this, there are four types of negative effects arising from intervention. These are:

- **Deadweight loss** – that which would have happened anyway;
- **Displacement** – negative effects on third parties, who are disadvantaged by the intervention;
- **Leakage** – effects, often positive, which leak outside the geographical area the study focuses on; and
- **Substitution** – where interventions incentivise stakeholders to use the intervention support to replace market-based provision.

In this analysis we do not seek to control for leakage or substitution. For leakage, given that employment and Value Added are based in the UK, some associated value may leak overseas in the form of repatriated profits or imports, but national accounting convention dictates that the impacts are counted where they are produced – i.e. in the UK. For substitution, because the whole point of Scale-up is a more coordinated approach, we do not envisage any significant substitution of new intervention for old.

Deadweight loss and displacement are likely to be significant in nature and as such are controlled for in the analysis.

Deadweight loss – controlling for micro-level incremental growth

Deadweight loss refers to that which would have happened anyway, in the absence of intervention, at the firm level. Observed annual turnover growth in GS10,000 and Endeavor supported firms are 16% and 68% respectively.²⁵ The necessary adjustments to these estimates are explained below.

GS10,000

A private initiative led by Goldman Sachs in partnership with Saïd Business School, Aston Business School, Leeds University Business School, Manchester Metropolitan University and UCL. It has assisted c.1,200 HGFs or potential HGFs to date through mentorship and professional support. It reports superior performance versus the general UK small business population.

The 16% turnover growth observed in GS10,000 firms is 25 percentage points higher than the all population average of -9% over the period in question. This does not imply that the GS10,000 programme caused the 25 percentage point difference in its entirety, and Mark Hart is currently working to understand the likely level of additional impact attributable to intervention by examining time series information on variables pre- and post-support.

²⁵ Goldman Sachs 10,000 Report, 2013, Stimulating Small Business Growth - Progress Report on the Goldman Sachs 10,000 Small Businesses UK Programme, and www.endeavor.org/impact/metrics

In future, work involving Randomised Control Trials (RCTs) will be used by Mark Hart and BIS to try and gain a better understanding of the additional impacts of business support intervention.

The exact results of the above exercise are not yet available to use, so it is necessary to assume a proportion of the 25 percentage point difference being attributable to intervention. We assume that a quarter of this premium is additional and attributable, which yields an intervention turnover growth premia of 6.25 per cent for firms receiving support. In the subsequent related scenario, this uplift is applied to all HGFs in the UK.

Endeavor

A non-profit organization, created to provide mentorship and professional support to high potential SMEs across the World. Endeavor provides high intensity, in-person support to a very carefully selected set of firms, across c. 20 primarily emerging economies.

Endeavor have provided us with specific information pertaining to the additional growth of firms they support. On average across the 20 countries they operate in, the firms receiving Endeavor support grow at 68% in the first two years after support.²⁶ In the absence of country average growth or a control group of firms, we apply a downward adjustment of 12 percentage points to reflect the average turnover growth of all Endeavor firms. This yields 56% above-population growth.

In the same way that we assume a quarter of the observed above-average turnover growth is contributed by the scheme for GS10,000, we apply the same factor to Endeavor. Accordingly we use an intervention turnover growth premia of 14 per cent for HGFs working with Endeavor. In the subsequent related scenario, this uplift is applied to all HGFs in the UK.

We note, however, that because the level of incremental turnover growth is based upon primarily emerging economies rather than the UK, there is some issue with applying such high growth rates to a country accustomed, in general, to lower rates of growth.

Displacement – controlling for ‘creative destruction’ across the macroeconomy

Various referred to as destruction, cannibalisation, or displacement, there is likely to be a considerable negative impact caused by greater growth within HGFs, affecting firms operating in the wider UK economy.

The concept of creative destruction was introduced in chapter two. The reallocation of resources to the most productive firms is a feature of a healthy economy, but it does mean that existing firms and jobs reliant on inertia are disadvantaged by innovation and competition to the extent that some level of economic activity is destroyed.

The academic literature shows that economies with a greater incidence of HGFs, tend to also have a high incidence of firms contracting at an equivalent pace, but on balance the net effect of job creation outweighs the associated job destruction.²⁷

To arrive at a percentage estimate of destruction in the UK we use underlying data provided by Albert Bravo-Biosca.²⁸ We are able to obtain a weighted average of net jobs created per gross job created for the UK between 2004 and 2007 (i.e. pre-recession).

This estimate is 31 per cent and is not time-variant. In other words, for every 100 jobs created by HGFs in the UK, the model assumes that 69 jobs in other areas of the UK economy are destroyed in the same year. There is some evidence that such destruction is lagged but this is not factored into our approach for simplicity, and over 20-years in aggregate the impact of the lag is likely to be minimal.

In the UK-style scenario, we apply the 69 per cent reduction (or equivalently the 31 per cent additionality ratio) to estimates of aggregated firm level incremental growth to obtain a ‘static’ estimate of the additional activity generated by HGFs across the UK economy.

We also consider an alternative value for displacement in the emerging economy style scenario. Here we apply a ‘rule-of-thumb’ estimate of 50 per cent to show the impact of greater scheme additionality. This is based upon discussions with stakeholders, some of whom regarded displacement approaching 70 per cent of net firm level impact as ‘excessive’.²⁹

²⁶ www.endeavor.org/impact/metrics

²⁷ For example, see figure 38 in Bravo-Biosca, 2013, Firm growth dynamics across countries: Evidence from a new database: really extended data appendix: supplementary tables and figures. This shows, in some detail, the level of creation and associated destruction of jobs.

²⁸ Bravo-Biosca, A. 2013, Firm growth dynamics across countries: Evidence from a new database, NESTA FORA.

²⁹ Additionality does vary significantly across interventions depending on type and scale. In terms of recent evidence on business support, the additionality ratio for Selective Financial Assistance on Northern Ireland (estimated by SQW and Aston University Business School) came in at 41 per cent. More broadly, the NIESR macro-evaluation of the Welfare to Work programme suggested that additionality was in the order of 4 to 8 per cent.

By not controlling for destruction elsewhere in the economy, the effects of promoting HGFs through Scale-up would be overstated to a significant extent, and a range of 50-70 per cent is deemed reasonable by stakeholders to cover these negative impacts.

Assessing other dynamic impacts

As well as effects internal to the HGFs supported and the negative external consequences across the economy, there are a number of distinct effects from intervention that also merit consideration in the model.

Productivity uplift

Economic theory suggests that the competitive dynamic within an economy works to reallocate resources to the most efficient firms and individuals and therefore leads to increased levels of productivity over time.

The wide body of research on HGFs and productivity suggests that there are justifications for including a HGF-led productivity uplift in our analysis, but that there are reasons for omitting such an adjustment at present.

Evidence for the inclusion of a productivity uplift

Research suggests that HGFs are associated with generating higher levels of productivity under certain conditions. Du et al find:

*"consistent and strong evidence of the relationship between TFP growth and HGF incidence. We find HGFs experience a self-reinforcing process with positive TFP growth interactions. Firms with higher productivity are more likely to grow faster in sales and in turn HGFs are more likely to achieve higher productivity growth."*³⁰

Similarly, unpublished research from Mark Hart on Extraordinarily Prolific Revenue Generators (EPRGs) suggests that turnover increases can be split equally into both scale-led (jobs) and productivity-led growth.

Du et al, go further, to posit:

"The policy implications are evident. Appropriately designed measures and instruments to stimulate high growth are expected to not only directly impact short-term sales growth, but also indirectly impact firm TFP growth that is crucial for sustainable economic growth. Moreover, wage and intangible assets are identified as indirectly affecting TFP growth through HGF experience, apart from their direct productivity enhancing effects."

*Policy makers may consider utilising these factors as either direct or indirect channels to stimulate productivity growth. Thus in the light of the ongoing debate about the average productivity lag in Europe compared with the United States, policy makers are hopeful that one of the ways to alleviate the gap is to support and fund innovative and rapidly growing businesses."*³¹

Other notable research suggesting HGFs add to productivity growth includes:

- Cross-country research by Bravo-Biosca indicating that economies with 5% more firms in the static class of zero growth are associated with a 1 percentage point reduction in annual Total Factor Productivity growth.³²
- Spatial research (for example from Stern and Delgado) showing that local spillovers from clustering increases productivity amongst other cluster members. This is evident in, for example, Cambridge, UK and Cambridge, MA, and is in keeping with the importance of local impact effects in Scale-up as highlighted by Isenberg.³³

Evidence against the inclusion of a productivity uplift

Du et al go on to strike a cautionary note in their work, regarding the way in which HGFs are defined and what that means for conclusions regarding productivity impact:

*"It is also noteworthy that the evidence we provide here is based on the HGFs defined in terms of sales; the same may not be the case for HGFs defined in terms of employment, which clearly needs to be investigated."*³⁴

Research by NESTA shows that HGFs "on their own" do not drive productivity growth, rather that it is the aggregate dynamic of creative destruction, or growth and contraction, that drives the enhancements, which in turn implies caution in ascribing productivity uplifts to HGFs alone.

Considering market dynamics, Bartelsman et al find that economies with more entry and growth barriers (less entry and exit) also have much wider within-industry distributions of total factor productivity. Greater entry and exit rates ensure that lower productivity firms are replaced with higher productivity firms. If there are impediments to this process, there is likely to be a greater proportion of below-average-efficient firms in an economy.³⁵

30 Du, Gong and Temouri, 2013, HGFs and productivity High Growth Firms and Productivity – Evidence from the United Kingdom, NESTA

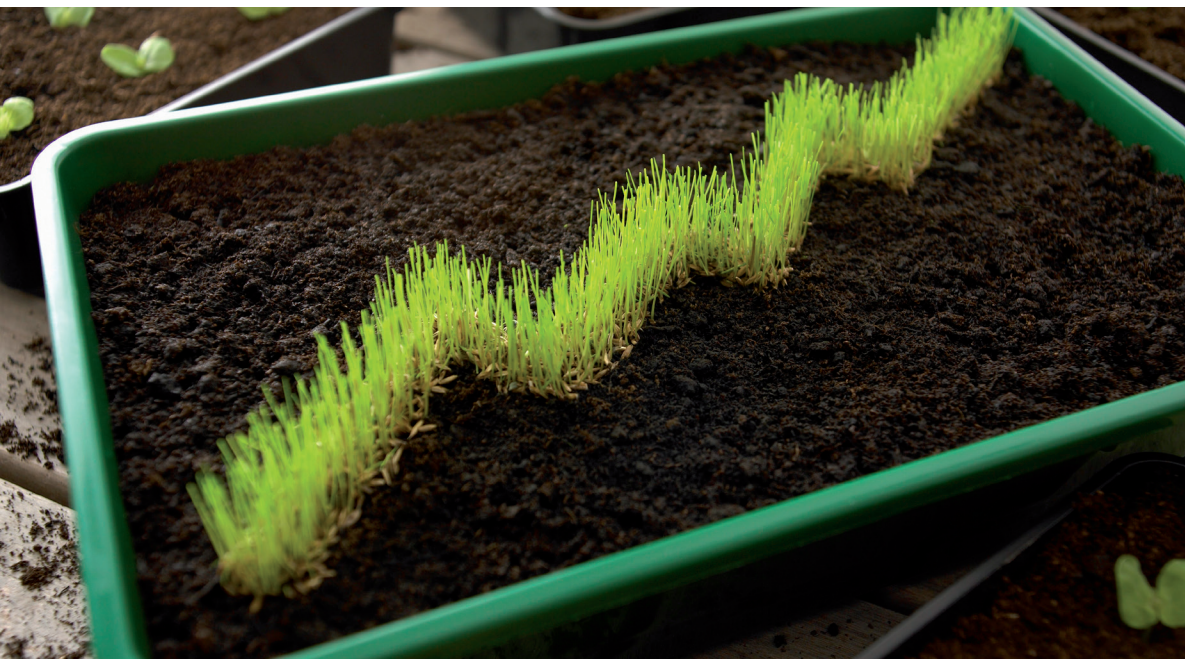
31 Du et al, Ibid

32 Bravo-Biosca, Ibid.

33 Delgado, Porter, and Stern, 2012, Clusters, Convergence, and Economic Performance, NBER Working Paper No. 18250

34 Du et al, Ibid

35 Bartelsman, Haltiwanger, and Scarpetta, Cross-Country Differences in Productivity: The Role of Allocation and Selection, American Economic Review 2013, Number 103



In brief:

- Evidence of the productivity effects of HGFs are sensitive to the definitions used; and
- HGFs contribute to the process of productivity enhancement in certain cases, but they do so as part of a wider functioning economic system.

On balance therefore ...

This suggests that where HGFs are defined on turnover growth (rather than employment), there is evidence of productivity enhancements within HGFs and the wider economy, but, where HGFs are defined on employment growth (rather than turnover) there is currently insufficient evidence regarding the HGF impact on within-firm, or wider economy, productivity.

Logically, this makes sense. Productivity can be measured in a number of ways, but common to all measures is the need to relate the ratio of outputs to inputs. Given that turnover is a measure of output and found in the numerator of any productivity measure, all else equal (and presuming employment and other inputs do not increase more quickly), productivity will increase in the short-term with increases in turnover. Conversely, if employment is driving growth, its appearance in the denominator of productivity measures, means that, in the short-term at least, without commensurate increases in output, productivity should be expected to fall.

This is borne out in the data at micro level: companies typically see labour productivity fall when they grow quickly in employment terms, with labour productivity increasing in the short-term as firms grow in turnover. Hart's own longitudinal evaluation work on policy interventions shows that employment effects tend to appear before revenue growth has had the chance to catch up. In time, revenue growth does tend to catch up and outstrip employment growth, but on a crude measure of labour productivity this effect is a recurrent observable in UK studies.

The findings in respect of incorporating HGF-related productivity uplift effects into the stock-flow model used are therefore nuanced.

Simplifying the academic research greatly, there are two broad types of HGF:

- Those defined on revenue growth which exhibit productivity growth; and
- Those defined on employment growth which are less likely to exhibit productivity growth, at least in the short-term (and where more research is required to understand the business dynamics at play).

36 As a further example of the logical underpinnings of productivity increases due to HGFs, Benoit Reillier suggested the following helpful and illustrative narrative. *"Many new innovative business models currently need to be able to scale up in order to reach critical mass and deliver their full economic potential. For example so called "platform businesses" (that act as catalysts for transactions between different interrelated consumer groups, such as buyers and sellers on eBay, or game developers and gamers) benefit from positive externalities on both sides of their market. This means that while a gaming platform with one game and a couple of clients is not very valuable, one with hundreds of games and millions of clients creates very significant economic value. The same is true with cab drivers on Uber, flats to rent on airbnb, and many others. Thanks to network effects, the scaled up business is worth much more than the sum of its parts. The productivity of these businesses is often significantly higher than the traditional businesses they may replace – when they are not creating new markets. This is why they are able to grow quickly and overcome barriers to entry [where barriers to entry do not exist] while offering superior products and services. They often offer lower prices to their consumers (this stimulates demand while pointing to strong indirect and induced economic effects). These businesses often have a global footprint by nature as they can scale up internationally and export once they have reached a critical mass. Being able to scale-up to reach that point is for them critical."*

The first type of HGF might be characterised, for example, by a technology-enabled company (in any sector) displaying 'platform' characteristics, with the second type characterised as a non-tech focused HGF with high levels of job creation.

As we have no way to distinguish between these two types of HGF for modelling purposes, we err on the side of caution and omit a productivity uplift from the analysis. This means we treat all HGFs as displaying average levels of productivity over time – in effect, turnover-led productivity gains in HGFs being cancelled out by employment-led productivity falls in HGFs. Many commentators believe that the net effect of HGFs is productivity gain at macroeconomic level and we consider this again in chapter four in the context of emerging research.³⁶

From a policy perspective, this apparent dichotomy need not be a bad thing – both employment growth and productivity growth are clear and stated macroeconomic policy aims of the UK government. It could even be an explicit aim of Scale-up to target HGFs defined on employment to provide specific support to ensure revenue growth and productivity 'catch-up' more quickly than they otherwise would.

Stimulation of activity across the supply-chain

We have already accounted for the negative impacts of HGFs on firms elsewhere in the UK economy, but there are also likely to be positive spillover effects to other existing (or not yet existing) firms that may (or may not) be HGFs themselves. We include the effect that HGFs have upstream in the supply-chain on organisations that provide the goods and services used by HGFs.

It is a complicated process to estimate other positive virtuous cycle impacts, both laterally on HGF competitors and complements, and downstream to the customers of HGFs who generate their own value from the goods and services HGFs provide. These effects, which can be truly transformational if highly innovative.

We choose to exclude consumer spending effects from the estimates provided. This is because HM Treasury typically do not recognise the consumer spending impacts of a policy intervention on the grounds that the evidence to underpin these effects is not as strong as that to include effects of firms in the supply-chain.

Accordingly we use a weighted average Type I multiplier from the Leontief Inverse of the ONS Domestic Use Matrix (2010), to isolate the UK impacts of supply-chain benefits to other firms in the UK. The weighted average multiplier is c. 1.63, meaning that for each additional £100 in output generated by HGFs, a further £63 in output is generated in those firms supplying HGFs.

Last mover disadvantage

Not all dynamic effects are positive. Last-mover disadvantage is a possibility, even if the economic returns to international trade are positive and the game is not 'zero-sum'.

The baseline case/counterfactual implicitly assumes that existing relativities in international competitiveness hold in future. However, there is an alternative baseline world, where fewer HGFs might be found. This could be a world where jobs would still be displaced by HGFs but the new businesses doing the displacement would primarily be based abroad because they move first and capture global market share. Here the UK would import more from HGFs overseas, and HGFs here would export less.

This would make the counterfactual appear much worse than presented in the next chapter, in turn making the Scale-up scenario (with first mover advantage) appear better than it does in the analysis.

We are unable to quantify these effects, but the assumption that the rest of the world 'stands still' in all this is a simplifying one.





3.2 Limitations of the analysis

There are a number of caveats below which should be considered when interpreting the results of the analysis in the next section.

- The 'ideal' information-set for HGFs is not perfect or widely available. Mark Hart, Albert Bravo-Biosca and many others in the UK have invested significant time in making sense of data from available sources to understand HGFs in the UK and international context. As the main Scale-up report identifies, the data exists within Government to unlock (subject to constraints) further value and allow easier and more effective analysis of this nature to be undertaken in future;
- There is a need to impose a 'business structure' in the UK over the next twenty years. This is based on trend extrapolations of business growth, which may, or may not be subject to error depending on outturns. Nonetheless, the extrapolations are not at odds with the underlying economic projections;
- The analysis is demand-based and does not impose any supply-side constraints on the model (beyond the adjustments for additionality pertaining to destruction). This is especially important with regard to the availability of the necessary skilled labour required to produce additional output. If the requisite level of skills are not possessed by the workforce in the medium-to-long-term, the outcomes presented here are likely to be much lower in magnitude. I.e. the analysis assumes a flexible labour market and supply of labour;

- The model includes a series of compounding assumptions, which whilst based largely on available and substantiated evidence, are still likely to be subject to error, especially where average effects are imposed and held constant over a 20-year period. This is why a range is presented and why the range presented is so wide; and
- Imposing dynamic effects on a static, non-econometric model does not allow for endogenous feedback mechanisms and, as noted by some consultees, may overstate or understate positive effects. That said, we are unsure that fully-fledged macroeconomic models such as HM Treasury's Computable General Equilibrium (CGE) Model of the UK would be able to consider impact for firms displaying specific high-growth characteristics, without significant and costly modification. This could be explored as part of a wider business case for changes in support mechanisms.

With these caveats in mind, whilst the quantum of impact presented in this report is naturally of interest to stakeholders and policy-makers, the values are presented as indicative and are intended to stimulate discussion, rather than provide a definitive set of estimates. In this sense they are very much 'what if?' projections rather than forecasts, laying out a framework that can be developed and refined.

4. The potential impact of Scale-up

This chapter provides estimates of the range of impact of Scale-up in the UK.



4.1 Scenarios

Three scenarios are assessed in the stock-flow model:

- Baseline – using Oxford Economics standard UK forecasts from July 2014;
- A UK-style intervention case – based on Scale-up providing an uplift in line with the GS10,000 experience;³⁷
- An emerging economy-style intervention case – based on Scale-up providing an uplift in line with the Endeavor experience in emerging economies.

In these scenarios, we are interested in the additional contribution of Scale-up, beyond baseline, after accounting for the ‘additional’ impact within HGFs, the negative effects on other firms through creative destruction, and after considering the limited dynamic effects outlined above, where we are able to arrive at an estimate.

Based on the method detailed in the previous section, we present the results of the analysis for each scenario.

4.2 Summary results

Each scenario is based around an additional 1,600 HGFs in the UK by 2034, which represents an increase of c. 12.5% on the baseline number in 2034, or a CAGR of 0.9 per cent rather than 0.3 per cent over the period.

In the baseline case, the net impacts of proposed Scale-up intervention are zero.

The most conservative scenario is the UK-style intervention, which is based upon a 6.25 per cent intervention turnover growth premium in firms benefiting from Scale-up support, and an economy-wide ‘destruction’ ratio of 69 per cent. In 2034 the associated increase in GDP is £3.4 billion above baseline and there are an additional 45,600 jobs in the UK as a result.

Applying the parameters from an emerging economy-style intervention, which is based upon a higher 14 per cent intervention turnover growth premium in firms benefiting from Scale-up support and a lower economy-wide ‘destruction’ ratio of 50 per cent, shows that in 2034 the associated increase in GDP is £11.2 billion above baseline and that there are an additional 151,000 jobs in the UK as a result.

Important note

All estimates presented in this section are provided in 2014 prices and are therefore net of inflation. We have not discounted the estimates to reflect the time value of money, but recognise that as part of any formal Green Book evaluation, a discount factor of 3.5 per cent would need to be applied. Neither have we considered costs to Government, or other parties, as part of the analysis, and the results presented in this section therefore show economic benefits and costs rather than financial costs to the Exchequer or financial or opportunity costs to others.

³⁷ This recognises that the actual level of intervention uplift is not yet available to use as a proxy.

Figure 4.2.a. The Net Impacts of Scale-up on the UK economy, 2015-2034

	Baseline	UK-style Minimum	EE-style Maximum
HGFs in 2013	10,170	10,170	10,170
HGFs in 2034	10,750	12,350	12,350
CAGR (2013–34, %)	0.3	0.9	0.9
Cumulative Additional Turnover within HGFs 2014-2034 (£bn, 2014 Prices)	0	277.2	571.8
Destruction of activity outside the HGF (£bn, 2014 Prices)	0	191.3	285.9
Cumulative 'Net' Turnover across the economy 2014-2034 (£bn, 2014 Prices)	0	85.9	285.9
Static			
Cumulative GDP Uplift 2014-2034 (£bn, 2014 Prices)	0	41.4	137.8
GDP Uplift in 2034 (£bn, 2014 Prices)	0	2.1	6.9
Net additional Jobs in 2034 (000s)	0	28.1	92.9
Total: including supply-chain stimulation			
Cumulative GDP Uplift 2014-2034 (£bn, 2014 Prices)	0	67.3	223.9
GDP Uplift in 2034 (£bn, 2014 Prices)	0	3.4	11.2
Net additional Jobs in 2034 (000s)	0	45.6	150.9

Source: Deloitte Analysis

Considering the cumulative uplift in each scenario between 2015 and 2034 shows that:

- In the UK-style intervention scenario the total uplift to GDP over the period is 0.15 per cent; and
- In the EE-style intervention scenario the total uplift to GDP over the period is 0.49 per cent.

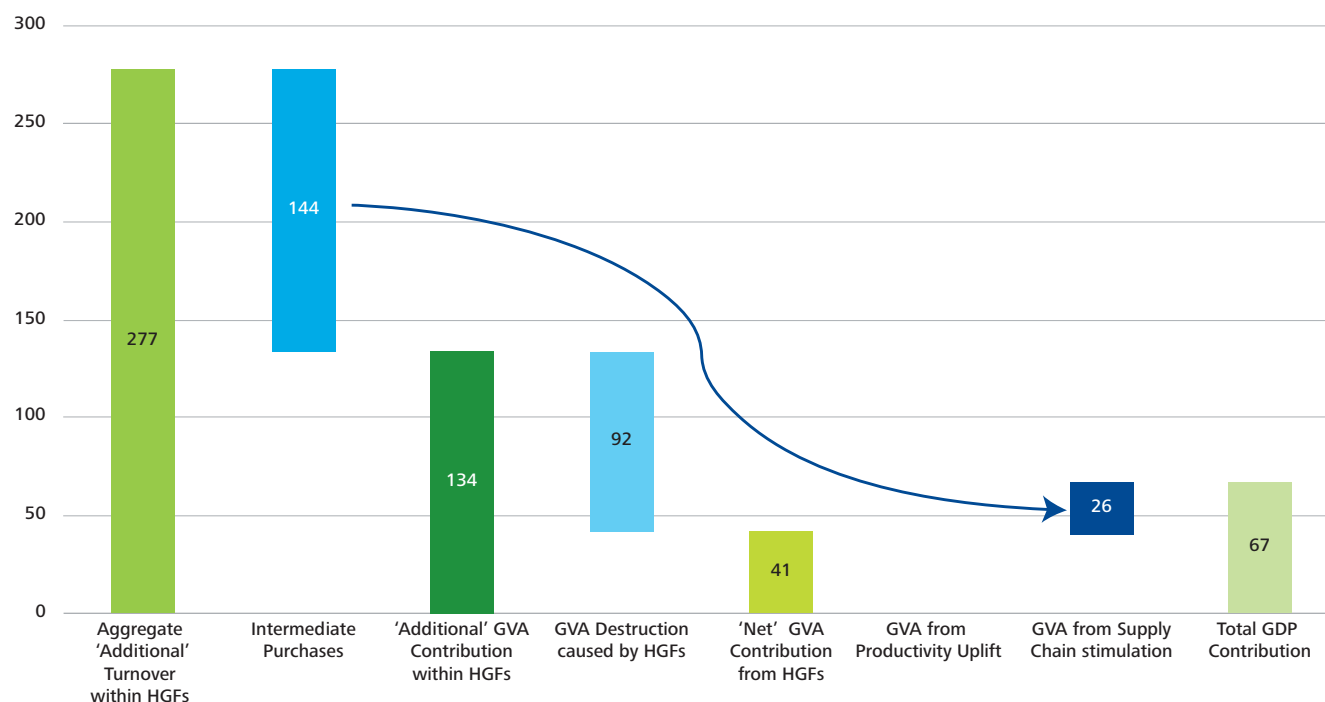
These ranges are wide, reflecting both uncertainty and potential, but the effects are likely to be material, even in the conservative case.

Given the scale of the UK economy, the effects presented here might appear insignificant in isolation, but we note that they are significant in the context of what can realistically be expected of such interventions.



Figure 4.3.a. UK-style Scale-up intervention scenario: Impact Waterfall, 2015-2034

Impact of UK-style scale-up intervention on HGFs and the UK Economy, 2015-2034 (Cumulative, £bn, 2014 Prices)



Note: Totals may not sum due to rounding

Source: Deloitte Analysis

4.3 UK-style Scale-up Intervention Scenario

Under the assumptions of a UK-style Scale-up intervention, the total GDP contribution between 2015 and 2034 is estimated to be £67billion (2014 prices).³⁸

The waterfall above, breaks out the constituent components of this impact, starting with the level of additional turnover within firms and ending with GDP contribution – the net economic impact.

The 6.25 per cent intervention turnover growth premium creates aggregate additional turnover of c. £280billion over the next two decades as a result of Scale-up intervention. Around 15 per cent of this turnover uplift (£42billion) comes from 'new' HGFs in a given three-year period, with the remainder from existing HGFs. Some of these HGFs will remain HGFs for longer than three years, and others will not. It is not possible to trace this impact on a per HGF basis, and in reality, this means that the contribution of new HGFs as a proportion of the total will be higher than 15 per cent.

Of the additional turnover, c. £145billion does not represent Value Added within HGFs – relating instead to intermediate inputs to production.

This means that approximately £135billion of the £280billion in turnover represents additional Value Added contribution within HGFs.

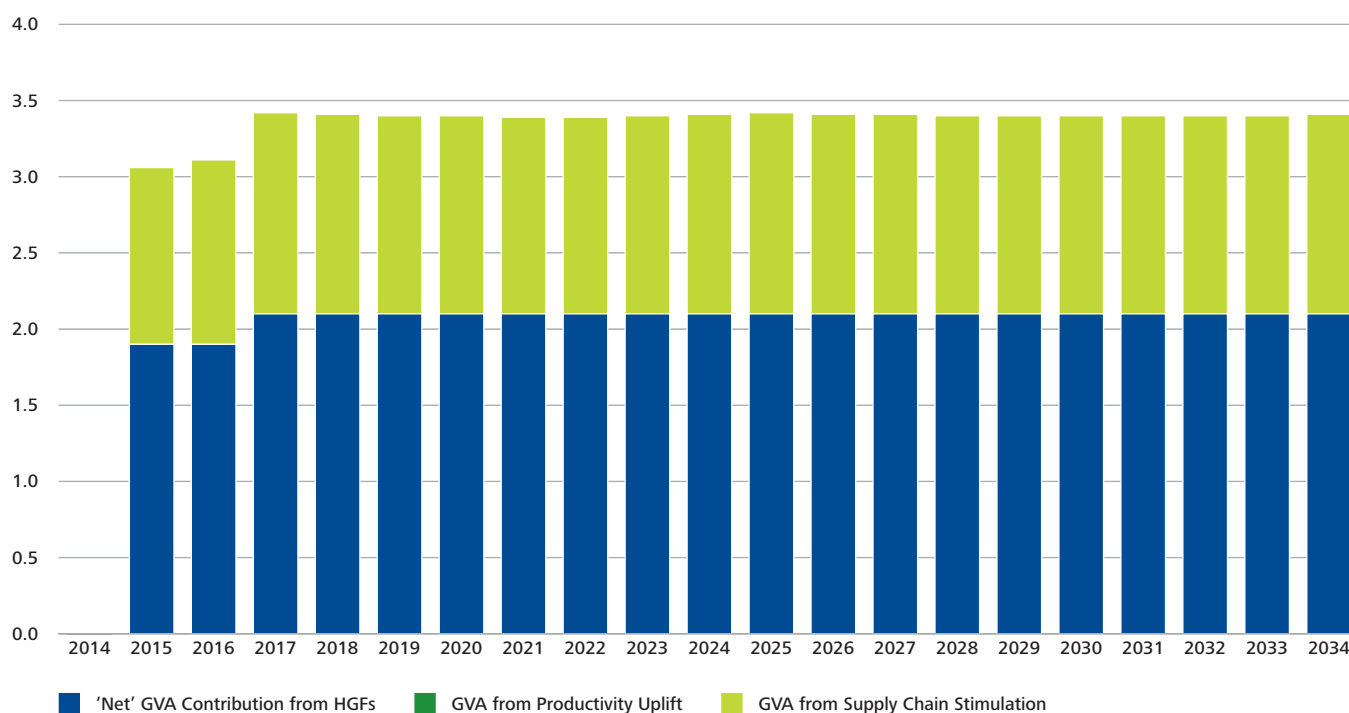
The process of creative destruction has a significant effect on the level of Value Added contribution generated across the whole economy by HGFs. When accounted for, the 'net' Value Added contribution to the economy by HGFs drops to a total of c. £40billion over the period – with around £90billion in output 'lost' to the economy in other firms that are affected adversely by the improved performance of HGFs.

Dynamic effects could increase the contribution beyond £60billion. We estimated that an uplift in productivity within HGFs could contribute an additional £10billion to the UK economy but have decided to omit this impact on the basis of academic research and the need for further evidence. Supply chain stimulation in the UK economy caused by additional purchases of intermediate inputs will add a further £25billion or thereabouts. In aggregate this yields a GDP contribution in the UK-style scenario of £67billion between 2014 and 2034 (non-discounted values).

³⁸ Though we do not present the results in discounted form in the main text, discounting the GVA benefits using 3.5 per cent to reflect the time-value-of-money (per HMT guidance), the overall cumulative benefit is on the order of £48billion – 70 per cent of the undiscounted total.

Figure 4.3.b. UK-style Scale-up intervention scenario: Annual GVA Impact, 2015-2034

GVA Contribution by Component, UK-style Scale-up intervention, (£bn, 2014 Prices)



In terms of job creation, the scenario suggests that c. 46,000 additional jobs will be created in the UK economy by 2034. Of these jobs, we would expect around 60 per cent to be within HGFs and 40 per cent to be outside the HGFs in other organisations benefitting from supply chain spending.

The level of employment within HGFs will be significantly higher than the 28,000 additional jobs implied, the difference between the gross estimate of jobs and 28,000 being the number of jobs displaced elsewhere in the economy through the process of creative destruction.

Figure 4.3.b shows how the benefits are profiled over time.

The time profile includes provision for a ramping up of the Scale-up initiative between 2014 and 2017. Annual fluctuations in the total contribution of Scale-up are caused by the variance in other areas of the model including business numbers and productivity per worker.

Previously, when an uplift in productivity was applied to the model the annual contribution increased over time, in line with above-baseline increments to productivity growth.³⁹ Omitting these productivity effects effectively assumes that productivity is the same as the baseline case, and impact is employment rather than productivity driven. Because general levels of productivity increase and employment supported per unit of output falls, this cancels out the increase from an increasing number of HGFs in the model.

Going back to the available evidence, many commentators dispute this. It will be interesting to revisit this question in future, when better data is available and the evidence on productivity effects of HGFs is clearer.

Post steady-state in 2017, the average annual contribution to the UK economy is c. £3.4billion towards GDP.

³⁹ One feature of this assumption is that for a given level of output, with productivity increasing in the economy over time, fewer jobs are required to produce that output. This is evident in the annual incremental impact shown in the annex.

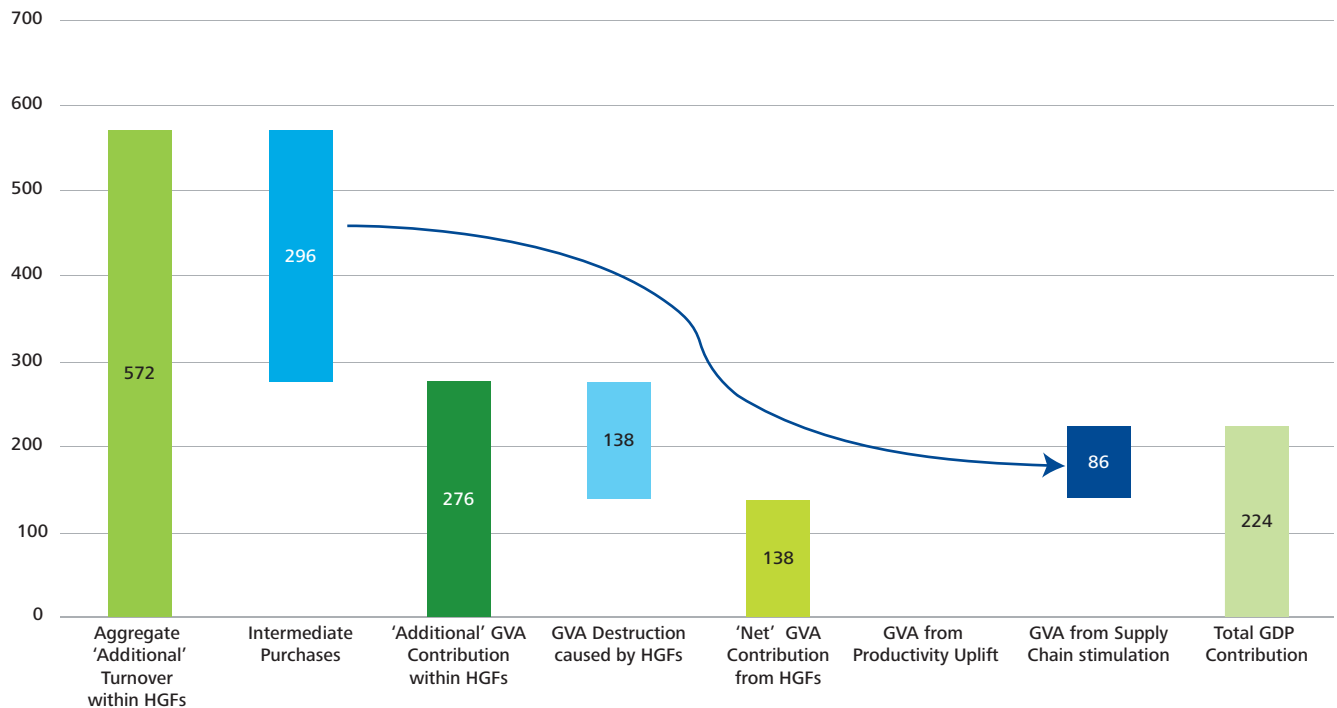
4.4 Emerging Economy-style Scale-up Intervention Scenario

In the same vein as the UK-style Scale-up intervention scenario, the results here give an indication of the level of benefits accruing when the intervention turnover growth premium increases to 14 per cent on the basis of the level of additionality seen within Endeavor's HGFs in emerging economies, and the destruction ratio is reduced to 50 per cent.

The overall contribution to GDP in this scenario is c. £225 billion over the next 20 years, stemming from aggregate additional turnover of £570 billion. In this scenario the level of destruction of activity in other firms is around £140 billion.

Figure 4.4.a. EE-style Scale-up intervention scenario: Impact Waterfall, 2015-2034

Impact of UK-style scale-up intervention on HGF'S and the UK Economy, 2015-2034 (Cumulative, £bn, 2014 Prices)



Source: Deloitte Analysis

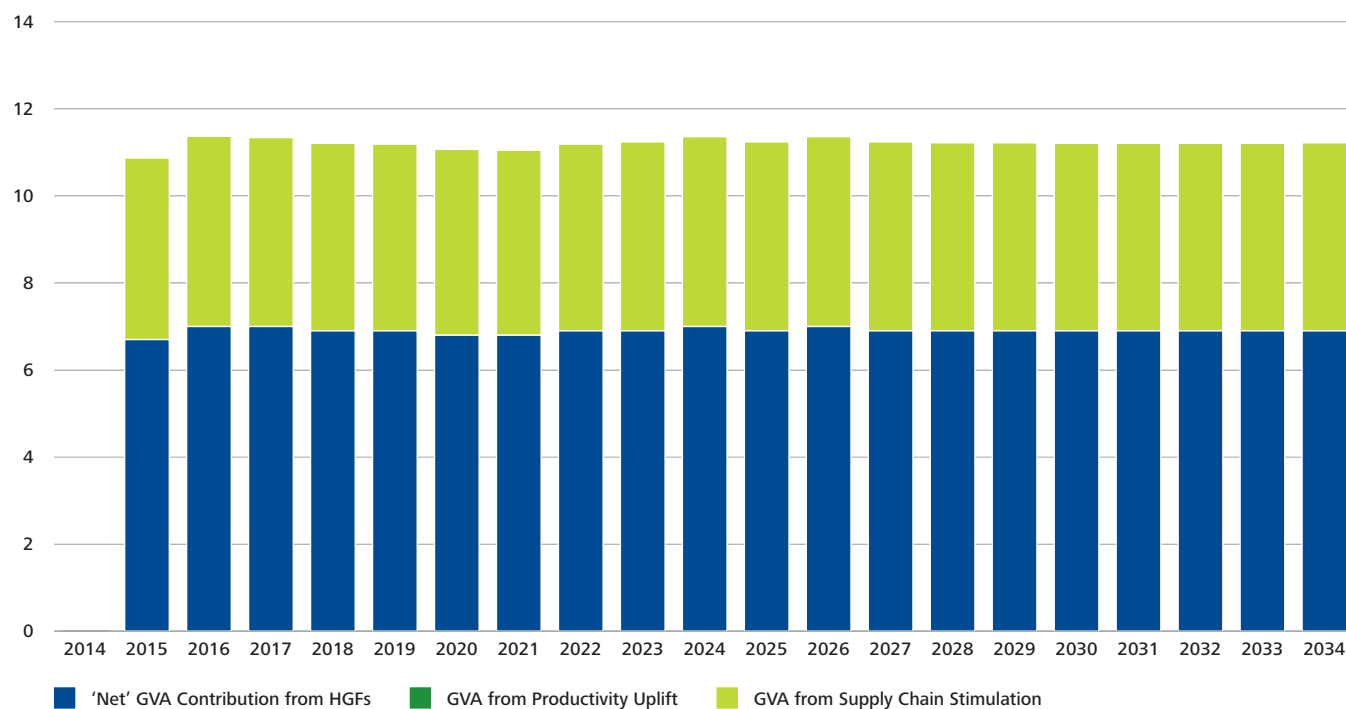
In terms of job creation, the scenario suggests that c. 150,000 additional jobs will be in place in the UK economy by 2034. Of these jobs, we would again expect around 60 per cent to be within HGFs and 40 per cent to be outside HGFs in other organisations benefitting from supply chain spending.

The level of employment within HGFs will be significantly higher than the 150,000 additional jobs implied, the difference from the gross estimate of jobs being the number of jobs displaced elsewhere in the economy through the process of creative destruction.

Figure 4.4.b shows how the benefits are profiled over time, which is much the same as the profile seen for the UK-style scenario.

Figure 4.4.b. EE-style Scale-up intervention scenario: Annual GVA Impact, 2015-2034

GVA Contribution by Component, UK-style Scale-up intervention, (£bn, 2014 Prices)



Source: Deloitte Analysis

40 Mason, Robinson, and Bondibene, Sources of labour productivity at sector level in Britain, 1998-2007: a firm-level analysis, A report to NESTA.

41 Allocative efficiency is defined by Investopedia as "A characteristic of an efficient market in which capital is allocated in a way that benefits all participants." Technically, maximum efficiency occurs when no entity is made worse off by a change.

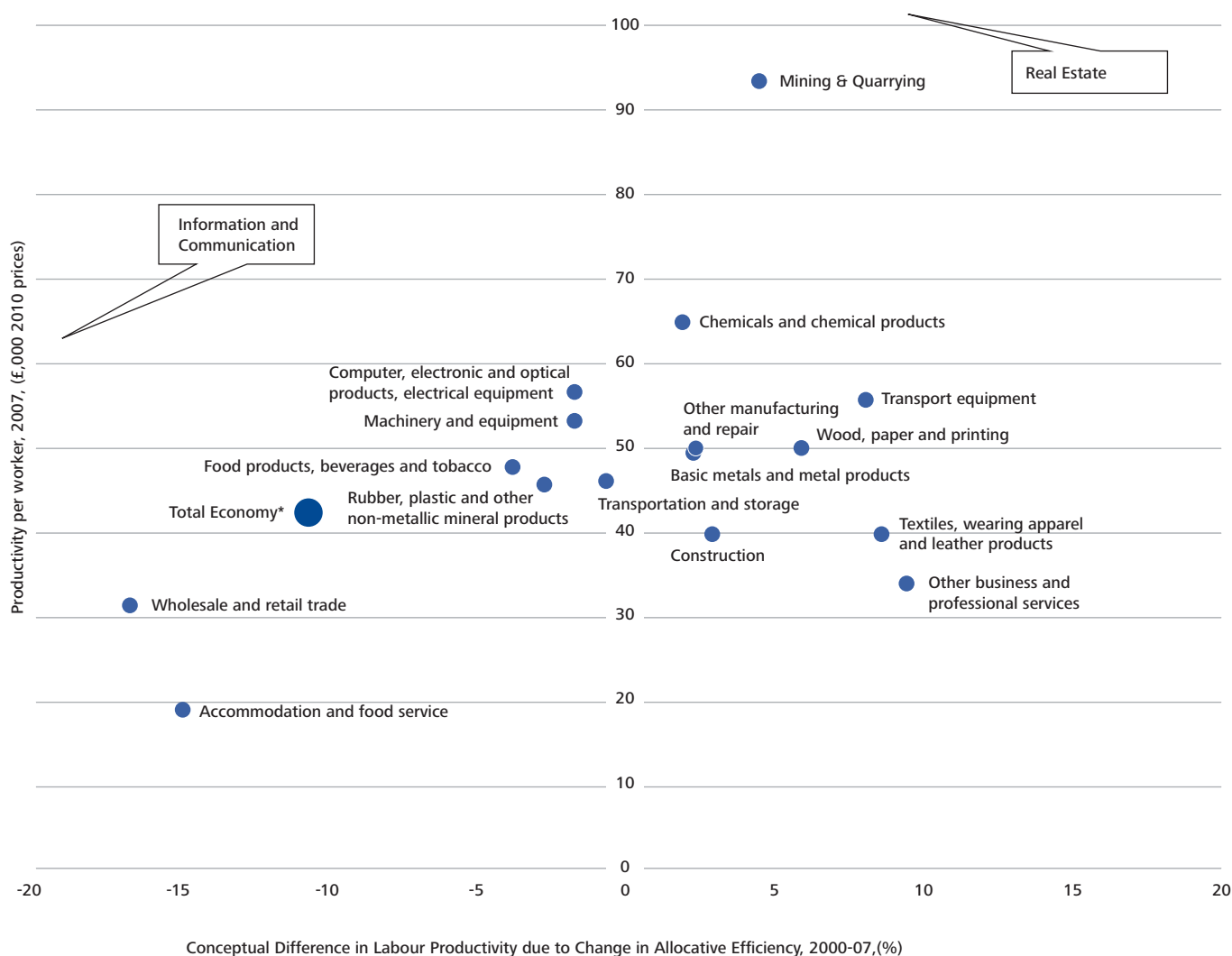
4.5 Productivity gains – the size of the prize

As discussed in chapter two, the nature of the evidence regarding the productivity effects of HGFs does not yet allow us to include productivity uplift in the core estimates presented above.

Timely research by Mason et al on behalf of NESTA suggests that in the UK, the aggregate allocation of resources has been worsening over time.⁴⁰

In the UK, resources are typically allocated towards the most productive companies, and as a result UK productivity over the full period was 10 per cent higher than it would have been if all UK firms had the same size. Conversely, allocative efficiency had been falling over time in the UK. If resources were as efficiently allocated in the latest period where data is available (2004-07), as they had been in the earliest one (1998-2000), UK aggregate productivity would have been 11 per cent higher than it was in 2007.⁴¹

Figure 4.5.a. Changes in allocative efficiency and absolute productivity by sector, 2000-07



Source: Deloitte Analysis, Mason et al, Oxford Economics

This happened across a backdrop of steady productivity growth and benign economic conditions between 1998 and 2007. Since then, the UK's productivity performance has worsened. It is not clear whether the competitive dynamic in the UK was influenced by the recessionary shock to such an extent that allocative efficiency might have improved in the interim against a backdrop of contraction/stagnation in absolute productivity levels, but wider research indicates that the problem persists in the form of the much documented 'productivity puzzle'. Examining the data, there is a reasonable degree of positive correlation between absolute levels of productivity in a sector, and the difference in allocative efficiency observed over the period in the same sector. In simple terms, allocative efficiency has tended to worsen in low-productivity sectors such as retail, hotels and catering. Two specific outliers are Information and Communication, which has relatively high productivity and saw a marked decline in allocative efficiency, and Other Business and Professional Services, which has below average productivity but has seen significant increases in allocative efficiency over the period.

Mason et al find, therefore, that in aggregate, allocative efficiency has increased in manufacturing and worsened in services. And because the sectors responsible for reductions in allocative efficiency accounted for more than half of all activity in the UK economy (55 per cent of employment across all the sectors covered in 2007), and the UK continued to restructure as a service-sector economy between 2000 and 2007, this explains why the aggregate effect across the economy is skewed so heavily to the negative – an 11 per cent hypothetical reduction in productivity due to a worsening in allocative efficiency over the period.

Accordingly, the research also controls for this 'structural shift' effect, to give a lower bound estimate 'within' sectors acknowledging the move to service sectors where productivity and efficiency is, on average, lower. The associated reduction in productivity due to a worsening in allocative efficiency over the period is 7 per cent, giving a range of 7 to 11 per cent.

Presuming that the 'gap' in labour productivity persists today, this leaves a significant 'prize' available for the UK if policy measures can be introduced to improve allocative efficiency. Scale-up and HGFs could be one pillar amongst many to increase the UK's allocative efficiency and productivity. Based on the 'gap' persisting (rather than worsening) over the intervening period, the lower bound estimate of 7 per cent, implies that UK GVA might have been £96billion higher than observed in 2014 – over 5 per cent of total UK GDP in today's prices.⁴²

The future test for Scale-up is whether more and better equipped HGFs can, and will, improve productivity outcomes for the UK, by allowing for a more efficient and timely allocation of resources, as highlighted by Mason et al in their paper. More widely, other related business support interventions might seek to do the same, for example by decreasing barriers to growth.

Mason et al also find:

"In line with a number of the plant level studies for the UK and other countries, we find that much of the reallocation [of resources] takes place within and between the continuing firms rather than as a result of entry and exit of firms in the Schumpeterian spirit. However, estimates of the net effects of entry and exit are found to conceal sizeable positive contributions to productivity made by some new entrants and sizeable negative contributions made by some exiting firms."

With regard to HGFs this means that new fast growing firms can make large positive contributions to productivity, but more worryingly that a number of firms with above-average productivity did not continue to operate, dragging down aggregate productivity over the period. The extent to which some of these were swallowed up in mergers and acquisitions is, admittedly, unclear.

We have not sought to factor such productivity effects into the main estimates presented earlier given the inherent difficulty, but the size of the productivity prize for the UK, through HGFs or otherwise, is obvious from Mason et al's research.

Scale-up and HGFs could be one pillar amongst many to increase the UK's allocative efficiency and productivity.

⁴² This simple extrapolation does not factor in any jobs displaced due to greater allocative efficiency. Mason et al excludes agriculture, financial services and the Government sector.



4.6 Considerations

During the course of the research we have noted a number of pertinent points for future consideration, which include, inter alia:

1. **Making more data available** on a timely basis, either directly from those collecting data, or through ONS, will allow linkage/mashing of data to generate insight, deliver better policy, and allow improved outcomes for the UK. Our work for Stephan Shakespeare and BIS on the Value of Public Sector Information considered the latent economic value in data not shared by Government – data on firm performance is an example of underutilised information.⁴³ A specific example is HMRC data for real-time PAYE to generate monthly estimates of gross and net job creation within firms.
2. Following on from this, **better data would allow a more sophisticated assessment, ex-ante, of impact** than the one presented here, and, over a longer timeframe, ex-post, would allow for effective monitoring and evaluation of outcomes. During the course of our work, it was suggested that bottom-up local level analysis should be conducted to consider impacts in more detail. This might only be practical with much improved data.
3. When examining, conceptually, how impact can be ascribed to different components of the Scale-up programme, it became apparent that the evidence does not exist at the moment to be able to say, *“access-to-finance will generate X per cent of benefits”, or “mentoring will lead to an increase in job creation of Y per cent”*. This should be an aim of any monitoring and evaluation process around Scale-up, though **it will be very difficult to isolate the impacts of specific interventions** and, by implication, isolate the impact of the coordination role central to the programme. We note that BIS is in the process of procuring further evidence on the additionality of interventions (productivity and displacement) at the UK level and this is welcomed.
4. **Skills.** No supply-side limitations were applied to the model used in the study – the analysis assumes that demand for skills (and finance) can be met through the programme and the myriad associated interventions by other stakeholders. It assumes sufficient skills are available within the UK’s available pool of labour to meet the demand from HGFs. If workers with the necessary skills are not available for HGFs, it will act as a barrier to long-term economic growth. In this event, the potential of HGFs, and the outcomes embodied in the model, and the ranges presented in the model, will not be realistic.
5. **Exports.** Some HGFs targeting export markets might displace existing UK firms operating in those export markets, but by focusing on overseas markets, the degree of destruction of existing UK activity is likely to be reduced. Targeting (saturated) domestic markets alone is likely to generate comparatively fewer economic benefits for the UK than a future where HGFs target export markets rather than/or in addition to domestic markets. Relating this to the analysis presented here, efforts by UKTI and other parties to encourage exports amongst HGFs, could reduce the effective rate of destruction and lead to greater economic benefit to the UK.
6. **Make significant noise about success and positive economic outcomes at national and local levels.** If “Role Model” effects can drive improved outcomes amongst peer firms, local (and national) level promotion of success is key to driving these additional benefits and successes should be championed.

⁴³ Deloitte, 2013, Ibid.

4.7 Setting a 'challenge'

Another way of considering the outputs of the modelling exercise is to reframe them on an individual HGF basis. This indicates what might need to be delivered in gross terms by HGFs to make good on the aggregate outputs at national level presented in this chapter.

It is a useful exercise as a sense-check for the analysis, but also within the context of 'Role Model' effects. Advertising a challenge to UK business, investors, universities, policy-makers, local economic development practitioners, academics and other stakeholders, to provoke competitive responses, might lead to a virtuous cycle of impact.

In summary, and presuming the within-firm and economy wide additionality assumptions hold:

- Each HGF (in existence at any point in time) would need to generate, on average, an additional £1.1m per annum in turnover above baseline. This is c. 6 per cent of average HGF turnover in the model;
- All else equal this equates to the generation of around 7 additional jobs within each HGF above baseline (create and sustain rather than an additional 7 jobs each year).

Clearly, this firm-level picture is based on simple averages and the distribution around these average requirements could come in infinite forms.

It is difficult to go beyond this in setting a challenge, but feasibly, 4 or 5 additional blockbusting HGFs that grow to be EPRGs – Extraordinarily Prolific Revenue Generators – might account for a significant share of any uplift in economic activity reducing the requirement on smaller HGFs. Conversely some HGFs will receive support and be unable to succeed.

Can HGFs, potential HGFs and the complex web of stakeholders be expected to respond to a challenge of this nature, and deliver for UK Plc?



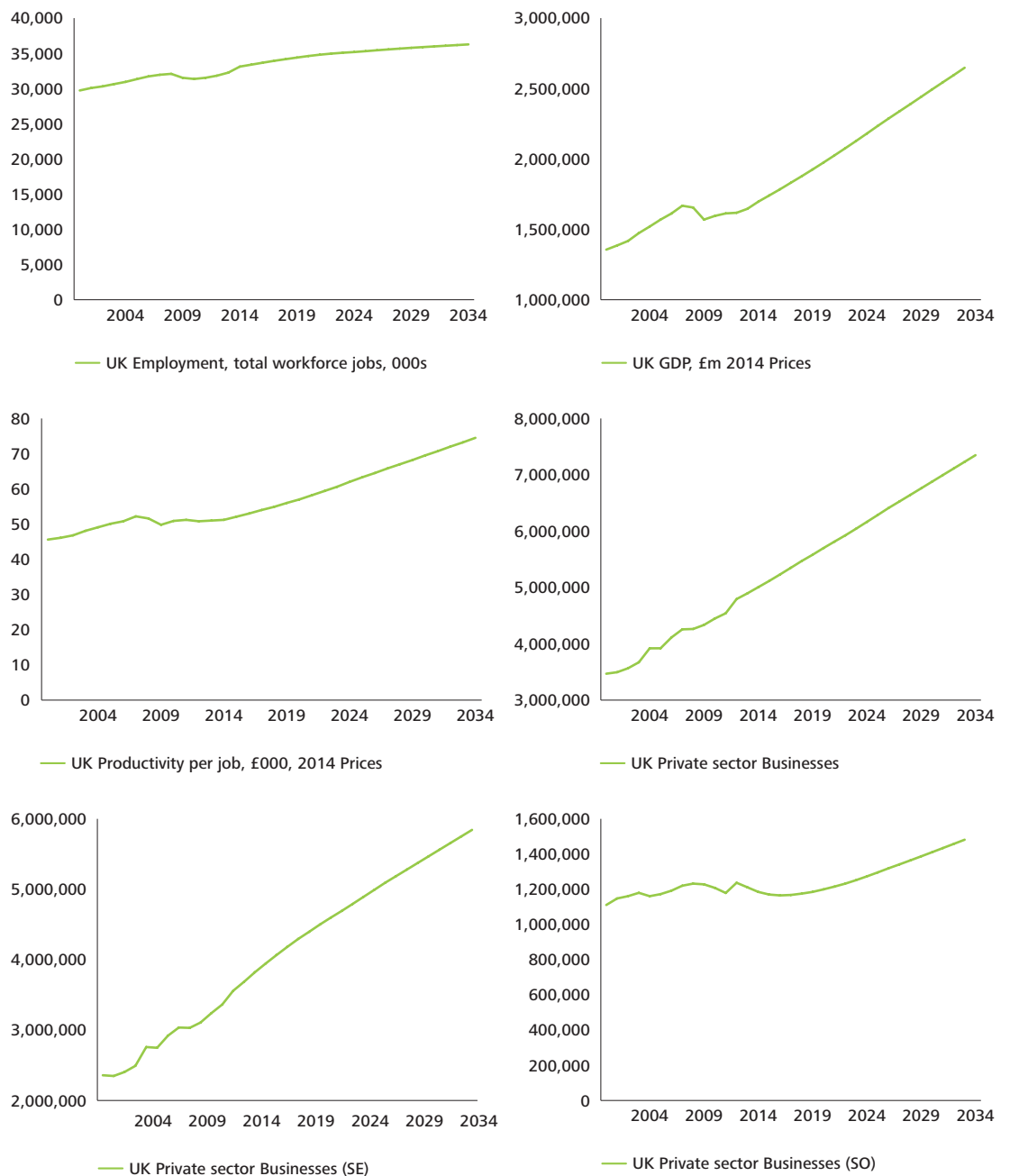
Annex 1: Method and data

This annex provides selected data used in the analysis.

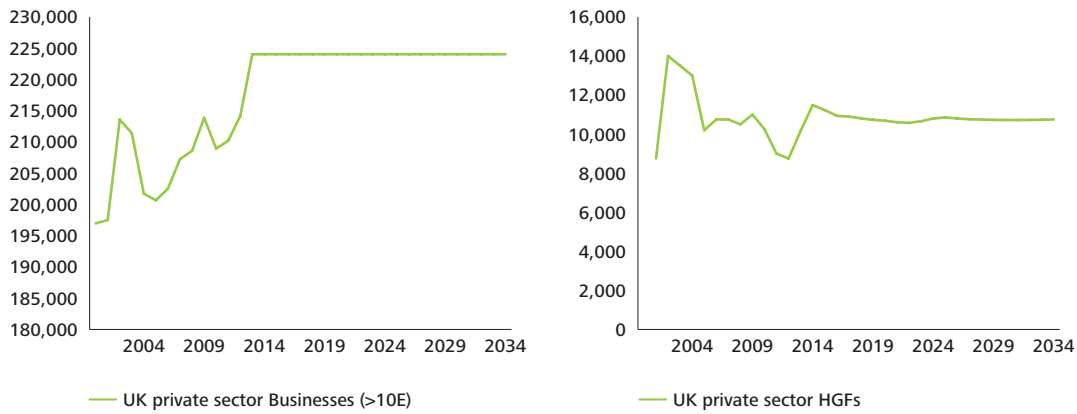
Baseline

NB After feedback we decided to set the level of UK private sector businesses with more than 10 employees as a constant value from January 2013, which in effect prevents any increase in the baseline level of HGFs in the UK between 2014 and 2034.

Selected Baseline Economic Data, Forecasts and Business Structure Extrapolations, 2000-2034



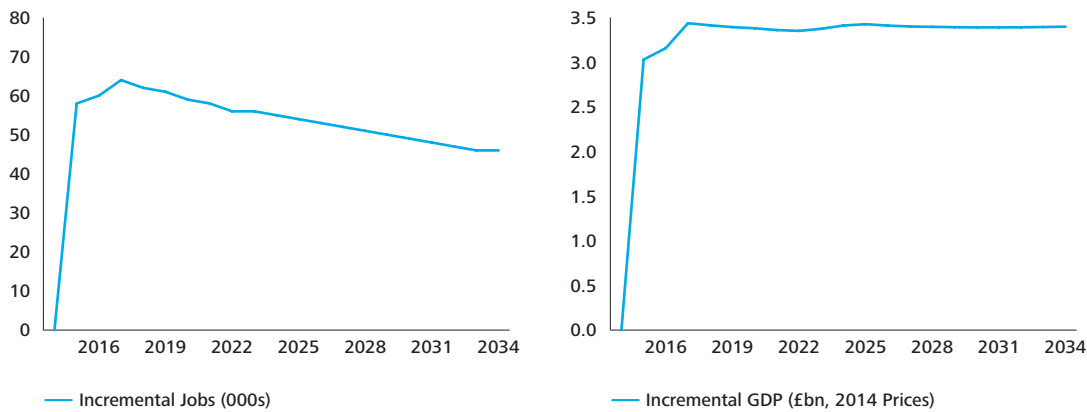
Source: Oxford Economics, BIS Business Population Estimates for the UK and the Regions 2013, Deloitte Analysis



Source: Oxford Economics, BIS Business Population Estimates for the UK and the Regions 2013, Deloitte Analysis

UK-style Scale-up Intervention Scenario

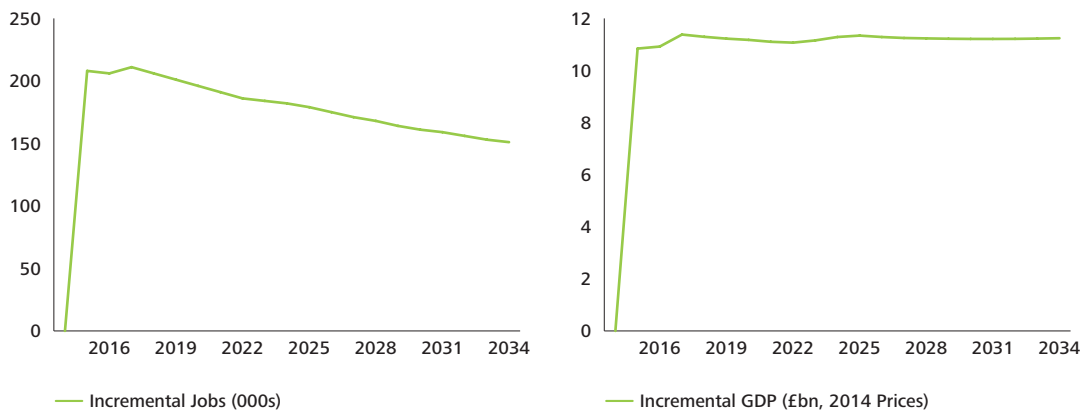
Selected UK-style Scale-up Intervention Scenario Outputs, 2014-2034



Source: Deloitte Analysis

Emerging Economy-style Scale-up Intervention Scenario

Selected Emerging Economy-style Scale-up Intervention Scenario Outputs, 2014-2034



Source: Deloitte Analysis

Annex 2: Bibliography

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